RO203

Hwang, Don, Env. Health

From: Woodburne, Keith [kwoodburne@TRCSOLUTIONS.com]
Sent: Monday, January 08, 2007 3:43 PM
To: Hwang, Don, Env. Health
Cc: Drogos, Donna, Env. Health; Shelby.S.Lathrop@conocophillips.com; Krupa, Monika
Subject: Request for Well Locations for Station No. 0746, 3943 Broadway, Oakland, CA
Attachments: Request for Well Locations Site #0746.pdf

Don,

TRC is again requesting your authorization to review well reports as part of a well survey for Station No. 0746 located at 3943 Broadway in Oakland. The original request letter was sent on November 21, 2006; however, to date TRC has not received any response or a signed authorization. TRC cannot complete the well survey without your authorization. Therefore, can you please sign and return, via fax, the attached well completion report release request at your earliest convenience?

Let me know if you have any questions regarding our request.

Thanks,
Keith

Keith Woodburne, P.G.
Senior Project Manager
TRC
1590 Solano Way, Suite A
Concord, CA 94520
T: (925) 688-2488
F: (925) 688-0388
C: (925) 260-1373
kwoodburne@trcsolutions.com

From: Krupa, Monika
Sent: Monday, January 08, 2007 3:28 PM
To: Woodburne, Keith
Subject: 0746 Sensitive Receptor Survey

Hello Keith,

Attached is a copy of the letter I sent to Don in November. Thank you for emailing him again.

Monika Krupa

Staff Scientist
TRC
Office:(925)688-2482
Cell:(925)250-3638
Fax:(925)688-0388

STATE OF CALIFORNIA - THE RESOURCES AGENCY — ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF WATER RESOURCES

CENTRAL DISTRICT	NORTHERN DISTRICT	SAN JOAQUIN DISTRICT	SOUTHERN DISTRICT
901 P Street	2440 Main Street	3374 E. Shields Ave Ste A7	770 Fairmont Avenue
Sacramento, CA 95814	Red Bluff, CA 96080	Fresno, CA 93726	Glendale, CA 91203
(916) 651-0753	(530) 529-7300	(559) 230-3300	(818) 500-1645 ext. 233
(916) 651-0726 (Fax)	(530) 529-7322 (Fax)	(559) 230-3301 (Fax)	(818) 543-4604 (Fax)

WELL COMPLETION REPORT RELEASE REQUEST AND CONFIDENTIALITY AGREEMENT REGULATORY-RELATED ENVIRONMENTAL CLEANUP STUDY

Well Completion Reports associated with wells located within two miles of an area affected or potentially affected by a known unauthorized release of a contaminant will be made available upon request to any person performing an environmental cleanup study associated with the unauthorized release, if the study is conducted pursuant to a regulatory agency order (Water Code Section 13752).

Requests must be made on the form below, signed and submitted to the appropriate DWR District Office. Please provide the township, range, and section of the property where the study is to be conducted. Attach a map or a sketch with a north arrow, and provide as much identifying information requested below as possible;-additional paper may be attached if necessary.

By signing below, the requester acknowledges and agrees that, in compliance with Section 13752, the information obtained from these reports will be kept confidential and will not be disseminated, published, or made available for inspection by the public. Copies obtained must be stamped **CONFIDENTIAL** and kept in a restricted file accessible only to authorized personnel. These reports must not be used for any purpose other than for the purpose of conducting the environmental cleanup study.

Project Name: 76 Service Station #0746 — County: Alameda

Street Address: 3943 Broadway — City: Oakland

Township, Range, and Section: T1S R4W 23,24,25,26 — Radius: 1/2 mile

(Include entire study area and a map that shows the area of interest.) (maximum 2 miles)

TRC	ALAMEDA COUNTY ENVIRONMENTAL HEALTH SERVICES
Requester's Company	Regulatory Agency Name
Monika Krupa	1131 HARBOR BAY PARKWAY ALAMEDA, CALIFORNIA 94502-6577
Requester's Name (**please print**)	Agency Contact Name (**please print**)
1590 Solano Way, Suite A	DON HWANG
Address	Address
Concord, CA 94520	
City, State, and Zip Code	City, State, and Zip Code
Signature: Monika Krupa	Signature: Don Hwang
Title: Staff Scientist	Title: HAZARDOUS MATERIALS SPECIALIST
Telephone: (925) 688-2482	Telephone: (510) 567-6746
FAX: (925) 688-0388	FAX: (510) 337-9335
Date: 11/21/2006	Date: 1/9/07
E-mail: mkrupa@trcsolutions.com	E-mail: don.hwang@acgov.org

COUNTY OF ALAMEDA
PUBLIC WORKS AGENCY
WATER RESOURCES SECTION
399 Elmhurst Street, Hayward, CA 94544-1395
James Yoo PH: (510) 670-6633 FAX: (510) 782-1939
FOR GENERAL DRILLING PERMIT INFO:
www.acgov.org/pwa/wells

WELL COMPLETION REPORT RELEASE AGREEMENT—AGENCY

(Government and Regulatory Agencies and their Authorized Agents)

Project No/ Site Address: 42016313-1111 3943 Broadway City: Oakland

Township, Range, and Section: T1S R4W 23,24,25,26 Radius: ½ mile
(Must include entire study area and a map that shows the area of interest.)

Under California Water Code Section 13752, the agency named below requests permission from Department of Water Resources to inspect or copy, or for our authorized agent named below to inspect or copy, Well Completion Reports filed pursuant to Section 13751 to (check one):

☐ Make a study, or,

☒ Perform an environmental cleanup study associated with an unauthorized release of a contaminant within a distance of 2 miles.

In accordance with Section 13752, information obtained from these reports shall be kept confidential and shall not be disseminated, published, or made available for inspection by the public without written authorization from the owner(s) of the well(s). The information shall be used only for the purpose of conducting the study. Copies obtained shall be stamped **CONFIDENTIAL** and shall be kept in a restricted file accessible only to agency staff or the authorized agent.

Monika Krupa, TRC Authorized Agent	 Government or Regulatory Agency
1590 Solano Way, Suite A Address	ENVIRONMENTAL [illegible] 1131 HARBOR BAY [illegible] ALAMEDA, CALIFORNIA 94502-6577 Address
Concord, CA 94520 City, State, and Zip Code	 City, State, and Zip Code
Monika Krupa Signature	Don Hwang Signature
Staff Scientist Title	HAZARDOUS MATERIALS SPECIALIST Title
Telephone (925) 688-2482	Telephone (510) 567-6746
Fax (925) 688-0388	Fax (510) 337-9335
11/21/2006 Date	1/9/07 Date
mkrupa@trcsolutions.com E-mail	don.hwang@acgov.org E-mail

ALAMEDA COUNTY ENVIRONMENTAL HEALTH DEPARTMENT
Division of Environmental Protection

1131 HARBOR BAY PARKWAY, SUITE 250
ALAMEDA, CA 94502-6577
Telephone (510) 567-6700 FAX (510) 337-9335

FACSIMILE COVER SHEET

To: MONIKA KRUPA

From: DON HWANG

Date: 1/9/07

Notes:

TRANSMISSION VERIFICATION REPORT

TIME : 01/09/2007 15:48
NAME : ALAMEDA COUNTY DEH
FAX : 5103379335
TEL : 5105676700
SER.# : BROK4J137311

DATE,TIME	01/09 15:47
FAX NO./NAME	19256880388
DURATION	00:00:35
PAGE(S)	03
RESULT	OK
MODE	STANDARD ECM

ALAMEDA COUNTY ENVIRONMENTAL HEALTH DEPARTMENT
Division of Environmental Protection

1131 HARBOR BAY PARKWAY, SUITE 250
ALAMEDA, CA 94502-6577
Telephone (510) 567-6700 FAX (510) 337-9335

FACSIMILE COVER SHEET

To: MONIKA KRUPA

From: DON HWANG

Date: 1/9/07

TRC

Customer-Focused Solutions

RO203

November 21, 2006 Project # 42016313

Mr. Don Hwang
Hazardous Materials Specialist
Alameda County Health Care Services
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

Site: 76 Service Station #0746
3943 Broadway
Oakland, California

Re: REQUEST FOR WELL LOCATIONS

Dear Mr. Hwang:

On behalf of ConocoPhillips, TRC is performing a sensitive receptor survey for the above referenced site. The survey is for the area within a ½ mile radius of 3943 Broadway in Oakland. We are requesting from you the authorization to continue with this survey by viewing Well Completion Reports for the domestic and municipal wells located within a ½ mile radius of the subject site. Upon your signature and return, the attached Well Completion Report Release Agreements from the Department of Water Resources and from the County of Alameda Public Works Agency Water Resources Section will be forwarded to each agency, respectively.

Should you have any questions, please feel free to call Keith Woodburne at (925) 688-2488 or myself at (925) 688-2482. Thank you for your time.

Sincerely,
TRC

Monika Krupa
Staff Scientist

1590 Solano Way, Suite A • Concord, California 94520
Telephone 925-688-1200 • Fax 925-688-0388

STATE OF CALIFORNIA - THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor
DEPARTMENT OF WATER RESOURCES

CENTRAL DISTRICT	NORTHERN DISTRICT	SAN JOAQUIN DISTRICT	SOUTHERN DISTRICT
901 P Street	2440 Main Street	3374 E. Shields Ave Ste A7	770 Fairmont Avenue
Sacramento, CA 95814	Red Bluff, CA 96080	Fresno, CA 93726	Glendale, CA 91203
(916) 651-0753	(530) 529-7300	(559) 230-3300	(818) 500-1645 ext. 233
(916) 651-0726 (Fax)	(530) 529-7322 (Fax)	(559) 230-3301 (Fax)	(818) 543-4604 (Fax)

WELL COMPLETION REPORT RELEASE REQUEST AND CONFIDENTIALITY AGREEMENT REGULATORY-RELATED ENVIRONMENTAL CLEANUP STUDY

Well Completion Reports associated with wells located within two miles of an area affected or potentially affected by a known unauthorized release of a contaminant will be made available upon request to any person performing an environmental cleanup study associated with the unauthorized release, if the study is conducted pursuant to a regulatory agency order (Water Code Section 13752).

Requests must be made on the form below, signed and submitted to the appropriate DWR District Office. Please provide the township, range, and section of the property where the study is to be conducted. Attach a map or a sketch with a north arrow, and provide as much identifying information requested below as possible;-additional paper may be attached if necessary.

By signing below, the requester acknowledges and agrees that, in compliance with Section 13752, the information obtained from these reports will be kept confidential and will not be disseminated, published, or made available for inspection by the public. Copies obtained must be stamped **CONFIDENTIAL** and kept in a restricted file accessible only to authorized personnel. These reports must not be used for any purpose other than for the purpose of conducting the environmental cleanup study.

Project Name: 76 Service Station #0746 County: Alameda

Street Address: 3943 Broadway City: Oakland

Township, Range, and Section: T1S R4W 23,24,25,26 Radius: 1/2 mile
(Include entire study area and a map that shows the area of interest.) (maximum 2 miles)

TRC Requester's Company	Regulatory Agency Name
Monika Krupa Requester's Name (**please print**)	Agency Contact Name (**please print**)
1590 Solano Way, Suite A Address	Address
Concord, CA 94520 City, State, and Zip Code	City, State, and Zip Code
Signature: Monika Krupa	Signature:
Title: Staff Scientist	Title:
Telephone: (925) 688-2482	Telephone: ( )
FAX: (925) 688-0388	FAX: ( )
Date: 11/21/2006	Date:
E-mail: mkrupa@trcsolutions.com	E-mail:

COUNTY OF ALAMEDA
PUBLIC WORKS AGENCY
WATER RESOURCES SECTION
399 Elmhurst Street, Hayward, CA 94544-1395
James Yoo PH: (510) 670-6633 FAX: (510) 782-1939
FOR GENERAL DRILLING PERMIT INFO:
www.acgov.org/pwa/wells

WELL COMPLETION REPORT RELEASE AGREEMENT—AGENCY

(Government and Regulatory Agencies and their Authorized Agents)

Project No/ Site Address 42016313-1111 3943 Broadway City Oakland

Township, Range, and Section T1S R4W 23,24,25,26 Radius ½ mile
(Must include entire study area and a map that shows the area of interest.)

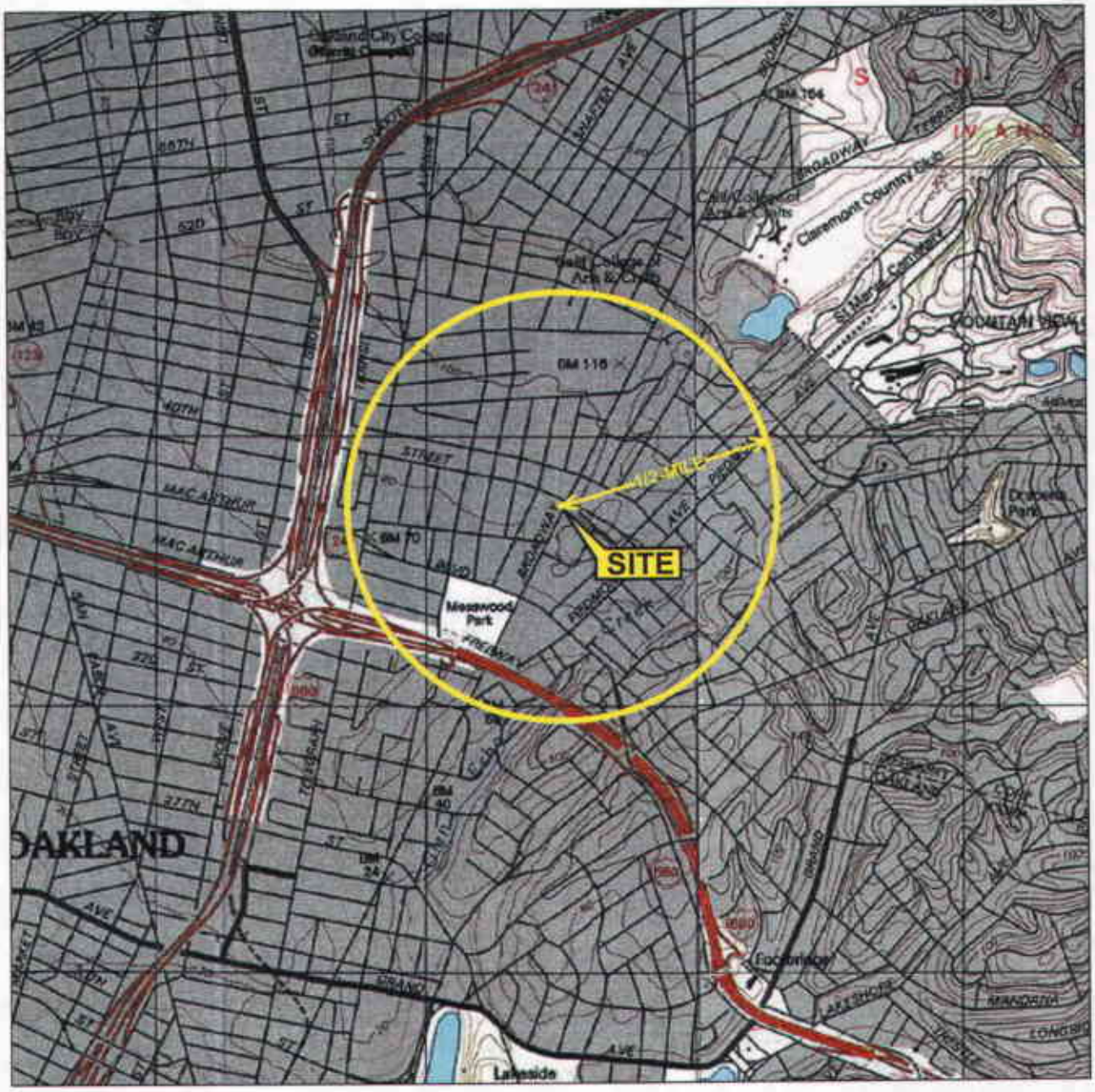
Under California Water Code Section 13752, the agency named below requests permission from Department of Water Resources to inspect or copy, or for our authorized agent named below to inspect or copy, Well Completion Reports filed pursuant to Section 13751 to (check one):

☐ Make a study, or,

☒ Perform an environmental cleanup study associated with an unauthorized release of a contaminant within a distance of 2 miles.

In accordance with Section 13752, information obtained from these reports shall be kept confidential and shall not be disseminated, published, or made available for inspection by the public without written authorization from the owner(s) of the well(s). The information shall be used only for the purpose of conducting the study. Copies obtained shall be stamped **CONFIDENTIAL** and shall be kept in a restricted file accessible only to agency staff or the authorized agent.

Monika Krupa, TRC Authorized Agent	Government or Regulatory Agency
1590 Solano Way, Suite A Address	Address
Concord, CA 94520 City, State, and Zip Code	City, State, and Zip Code
Monika Krupa Signature	Signature
Staff Scientist Title	Title
Telephone ☎ (925) 688-2482	Telephone ( )
Fax ⇆ (925) 688-0388	Fax ( )
11/21/2006 Date	Date
mkrupa@trcsolutions.com E-mail	E-mail



1 MILE 3/4 1/2 1/4 0 1 MILE

SCALE 1 : 24,000

N

SOURCE:

United States Geological Survey
7.5 Minute Topographic Maps:
Oakland East and Oakland West
Quadrangles, California

SENSITIVE RECEPTORS WITHIN ONE-HALF MILE RADIUS OF SITE

76 Service Station #0746
3943 Broadway
Oakland, California

TRC | FIGURE

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

March 25, 2005

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

Thomas H. Kosel, Site Manager
Risk Management and Remediation
ConocoPhillips
76 Broadway
Sacramento, CA 95818

Dear Mr. Kosel,

Subject: Fuel Leak Case N[redacted]03, Unocal Service Station No. 0746,
3943 Broadway, Oakland, CA

Alameda County Environmental Health (ACEH) staff has reviewed "Work Plan for Dual-Phase Vacuum Extraction Pilot Test" dated September 23, 2004, "Dual-Phase Vacuum Extraction Application at Each Site" via email dated March 14, 2005, "Draft Multi-phase Extraction Standard Operating Procedure" via email dated March 18, 2005, all prepared by TRC. We approve the Work Plan. We request that you perform the work and send us the technical reports requested below.

TECHNICAL REPORT REQUEST

Please submit technical reports to Alameda County Environmental Health (Attention: Don Hwang), according to the following schedule:

May 25, 2005 - Dual-Phase Vacuum Extraction Pilot Test

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

If you have any questions, I may be reached at (510) 567-6746.

Sincerely,

Don Hwang
Hazardous Materials Specialist
Local Oversight Program

C: Roger Batra, TRC, 1590 Solano Way, Suite A, Concord, CA 94520
Donna Drogos
File

Hwang, Don, Env. Health

From: Batra, Roger [rbatra@TRCSOLUTIONS.com]
Sent: Friday, March 18, 2005 10:12 AM
To: Hwang, Don, Env. Health
Cc: Thomas.H.Kosel@conocophillips.com; Shelby.S.Lathrop@conocophillips.com
Subject: RE: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Attachments: 2887_001.pdf

2887_001.pdf (302 KB)

Don,

Here is a generic SOP that we follow for conducting MTS events at UST sites.

Thanks,

Roger Batra
Senior Project Manager
TRC

-----Original Message-----
From: Hwang, Don, Env. Health [mailto:don.hwang@acgov.org]
Sent: Thursday, March 17, 2005 2:08 PM
To: Batra, Roger
Subject: RE: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Roger, I looked at the website. Still, the information regarding MTS is about its capabilities. Do you have Standard Operating Procedures which describes how the MTS will be operated? Thanks, Don

-----Original Message-----
From: Batra, Roger [mailto:rbatra@TRCSOLUTIONS.com]
Sent: Thursday, March 17, 2005 10:17 AM
To: Hwang, Don, Env. Health
Cc: Thomas.H.Kosel@conocophillips.com; Shelby.S.Lathrop@conocophillips.com
Subject: RE: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Don,

TRC has a website, www.trcmts.com, and a lot of information regarding MTS is available on that site. Hope that will help.

Thanks,

Roger Batra
Senior Project Manager
TRC

-----Original Message-----
From: Hwang, Don, Env. Health [mailto:don.hwang@acgov.org]
Sent: Tuesday, March 15, 2005 5:40 PM
To: Batra, Roger
Subject: RE: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro

Street), and 5043 (449 Hegen[redacted]ger Road), Oakland, California[redacted]

Roger, Do you have an SOP for the MTS? Thanks, Don

-----Original Message-----
From: Batra, Roger [mailto:rbatra@TRCSOLUTIONS.com]
Sent: Tuesday, March 15, 2005 8:59 AM
To: Hwang, Don, Env. Health
Cc: Thomas.H.Kosel@conocophillips.com;
Shelby.S.Lathrop@conocophillips.com
Subject: FW: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Don,

Here is the response to your question for each site.

Thanks,

Roger Batra
TRC

-----Original Message-----
From: Trevor, Mark
Sent: Monday, March 14, 2005 11:12 AM
To: Batra, Roger
Subject: RE: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Here is a short paragraph on DPVE application at each site.

3135:
Dissolved-phase hydrocarbon concentrations in the target well (MW-6) have been 1,000 to 8,000 ug/L during the last 4 monitoring events. Prior to that, concentrations were in the 10,000 to 30,000 ug/L range. Depth to groundwater is approximately 6 fbg and the soil in the vadose zone consists of well graded sand. The high concenrations in a localized area, combined with shallow groundwater and permeable soil make this location a good candidate for short-term dual-phase extraction. It is anticipated that vapor-phase hydrocarbons will be removed from the vadose zone and possibly from the saturated zone if water levels can be lowered. In addition, hydrocarbon-impacted groundwater will be removed from the subsurface. Dissolved-phase hydrocarbon concentrations may be lowered significantly at relatively little expense using this technology.

0746:
Dissolved-phase hydrocarbon concentrations in the target wells (MW-3, MW-5 and RW-1) have been on the order of several thousand ug/L with free-product in MW-5. Benzene and MTBE have also been detected in MW-3 and RW-1. Depth to groundwater is approximately 10 fbg and the soil in the vadose zone consists of fine to medium grained fill or clay. The soil in the water bearing zone is coarse-grained gravel and sands. The high concenrations in a localized area, combined with shallow groundwater and a coarse-grained water-bearing zone make this site a potentially good candidate for short-term dual-phase extraction. It is anticipated that dissolved- and vapor-phase hydrocarbons will be removed from the saturated zone and to a lesser extent from the fine-grained vadose zone soils. In addition, hydrocarbon-impacted groundwater will likely be removed from the subsurface.

5043:
Dissolved-phase hydrocarbon concentrations in the target well (MW-6)

have been 71,000 to 110,000 ug/L during the last 4 monitoring events. Concentrations have been consistent with this for the past 4 years. Depth to groundwater is approximately 2 fbg and the soil in the upper 7 feet consists of sandy clayey fill. The high concenrations in a localized area, combined with shallow groundwater and semi-permeable soil make this location a good candidate for short-term dual-phase extraction. A DPVE event conducted in 1999 on MW-6 removed approximately 300 pounds of vapor-phase hydrocarbons and appeared successful at removing the recurring free-product in MW-6. It is anticipated that vapor-phase hydrocarbons will be removed from the vadose zone and possibly from the saturated zone if water levels can be lowered.

-----Original Message-----
From: Batra, Roger
Sent: Friday, March 11, 2005 11:50 AM
To: Trevor, Mark
Subject: FW: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Mark,

Please see me regarding a response to Don Hwang at Alameda County. I would like to get a response to him by Monday.

Thanks,

Roger
-----Original Message-----
From: Hwang, Don, Env. Health [mailto:don.hwang@acgov.org]
Sent: Friday, March 11, 2005 11:12 AM
To: Batra, Roger
Subject: RE: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Roger,

I've reviewed Work Plans for Dual Phase Vacuum Extraction Pilot Test for 0746 (3943 Broadway) and 5043 (449 Hegenberger Road), but can't find 3135 (6535 San Leandro Street) because we have it listed under a different address, do you have another address and which address should be used? The Work Plans are similar, specs for the MTS are given & which well will be used. For each site, please state how your proposals have a reasonable expectation to be effective.

Don

-----Original Message-----
From: Batra, Roger [mailto:rbatra@TRCSOLUTIONS.com]
Sent: Tuesday, March 08, 2005 3:17 PM
To: Hwang, Don, Env. Health
Subject: FW: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Don,

Here it is. I did not have the period between your first and last name. Thanks.

Roger Batra
TRC
925-688-2466

> -----Original Message-----
> From: Batra, Roger
> Sent: Tuesday, March 08, 2005 2:37 PM
> To: 'donhwang@acgov.org'
> Cc: 'Thomas.H.Kosel@conocophillips.com';
'Shelby.S.Lathrop@conocophillips.com'
> Subject: 76 Stations 0746 (3943 Broadway), 3135 (6535 San
Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California
>
>
> Don,
>
> TRC on behalf of ConocoPhillps Company (ConocoPhillips) had submitted
the following documents for the subject sites to Alameda County Health
Services in September/October 2004.
>
> 76 Station No. 0746, 3943 Broadway, Oakland, California
>
> Work Plan for Dual Phase Vacuum Extraction Pilot Test dated September
23, 2004.
>
> 76 Station No. 3135, 6535 San Leandro Street, Oakland, California
>
> Work Plan for Dual Phase Vacuum Extraction Pilot Test dated September
23, 2004.
>
> 76 Station No. 5043, 449 Hegenberger Road, Oakland, California
>
> Work Plan for Dual Phase Vacuum Extraction pilot Test dated October
> 11, 2004
>
> TRC has scheduled the pilot tests at these sites to take place in late
March/early April 2005. The pilot tests will be conducted using TRC's
Mobile Treatment System, a truck-mounted, dual-phase soil-vapor and
liquid extraction system. In addition, prior to commencement of onsite
work, TRC will notify the Bay Area Air Quality Management District of
the proposed activities.
>
> No comments have been received from Alameda County Health Services
> since the submittal of the Work Plans for the subject sites. In
> accordance with 60-day rule (CCR Title 23, Division 3, Chapter 16,
> Article 11, Section 2722, 2e), TRC on behalf of ConocoPhillips can
> proceed with the dual-phase vacuum extraction pilot tests at the
> subject sites. If we do not hear back from you by March 18, 2005 we
> will assume you have no objections to the implementation of the
> aforementioned Work Plans
>
> Please call me should you have any questions or need additional
information.
>
> Thanks,
>
> Roger Batra
> Senior Project Manager
> TRC
> 1590 Solano Way, Suite A
> Concord, California 94520
> 925-688-2466 (Direct)
> 925-260-6405 (Cell)
>

3/18/05

Draft Multi-phase Extraction Standard Operating Procedure

This document provides guidance to remediation contractors operating multi-phase extraction (MPE) systems. Emphasis is placed on current remediation objectives of the mobile MPE trailers which focus on product removal or dissolved hot-spot cleanup through short-term (30-60 day) operation. Many of the operating decisions described herein will be applicable to longer-term MPE remediation systems, although monitoring schedule and scope may be significantly altered. This is a working document, subject to change and improvement as needed. The purpose is to establish a standardized methodology for performing MPE remediation, and thereby improve system flexibility, efficiency, effectiveness, and cost reduction.

I. Multi-phase Extraction Objectives and Overview

UST gasoline release volume is often sufficient for non-aqueous phase liquid hydrocarbon (NAPL) to migrate to the water table, forming a non-wetting phase in soils of the upper saturated zone. Modern multi-phase flow theory recognizes this zone as an area of intimate contact between NAPL and water, representing a long-term source for dissolved phase contamination. Since NAPL displaces the wetting phase (water) it is mobile only so long as saturations are sufficient to maintain fluid pressures exceeding the pore entry pressures of adjacent soil pores. As seasonal water table fluctuations occur, NAPL is distributed vertically through an increasingly larger soil volume, causing a reduction in saturation throughout the NAPL plume. As saturations decline, the majority of the NAPL mass eventually becomes trapped as discontinuous ganglia within a "smear zone"[1]. Since saturations are low within the smear zone, little NAPL can be removed through drainage. Multi-phase extraction (MPE) systems are designed to dewater smear zone soils, induce air flow, and remove NAPL through volatilization.

MPE systems have two primary configurations. The first is dual-phase extraction (DPE), utilizing separate mechanical systems for pumping groundwater and extracting soil vapor. The second is two-phase extraction (TPE), where a single vacuum pump is used to extract both water and soil vapor through small diameter piping inserted in recovery wells. The most cost-effective MPE configuration is determined by aquifer permeability and corresponding well yield of both water and air (Figure 1). MPE systems are designed to operate at moderate to high vacuums (12-25" Hg), which create an inward radial pressure gradient in the vicinity of extraction wells. Subsurface vacuum enhances gravity-driven hydraulic gradient, which increases water yield to extraction wells and can generate a much broader cone of depression than would be possible under atmospheric pressure conditions. Since the objective of MPE remediation is to dewater the smear zone and volatilize NAPL, primary operational metrics are based on aquifer drawdown and vacuum distribution. Maximizing drawdown and annular vacuum in extraction wells optimizes both.

II. Dual-Phase Extraction Systems

DPE systems typically include an air compressor and pneumatic downhole pumps for groundwater extraction, and a rotary lobe vacuum pump for concurrent vapor extraction at moderate vacuum. Vapor effluent may be treated with a thermal oxidizer, or may be discharged direct to the atmosphere where permitted. Extracted groundwater is processed through an oil/water separator, surge tank, air stripper, and final carbon polish (if necessary) prior to discharge to a POTW or surface drainage through NPDES permit.

---

[1] Monitoring wells in the center of the smear zone may contain ephemeral thicknesses of locally mobile NAPL, although the plume as a whole is immobile.

DPE system performance monitoring data include:

- Groundwater extraction pump depth
- Groundwater extraction rate (on an individual well basis)
- System operating vacuum
- System air flow rate
- System VOC concentration
- Wellhead operating vacuum
- Wellhead air flow rate
- Wellhead air flow control valve setting
- Wellhead VOC concentration
- Vacuum in adjacent monitoring wells
- Drawdown in adjacent monitoring wells

These data allow well-specific system adjustments based on degree of drawdown, yields of water and air, and mass removal rate.

IIA. DPE Groundwater Extraction System Setup:

Groundwater extraction pumps should be placed at a depth such that the pump intake allows maximum well dewatering. This may not be practical at sites with excessive yields where wells may not be completely dewatered to the pump intakes. Excessive yields are generally greater than 6-7 GPM/well for 2" diameter wells, and 12-14 GPM/well for 4" diameter wells. If either individual well yield is too great for pump capacity, or combined yield is too large for the groundwater treatment system, pumps should be raised to reduce dewatering and lower flow rates. In such cases, pumps should be set at a depth corresponding to an interpreted base of the smear zone[2], or generally as deep as water treatment or pump capacity will permit. Preferred pump types will utilize internal level controllers (e.g., clean environment, QED), since these controller designs do not require external pressure reference to casing vacuum, generally use less air/cycle, pump only water, and are reliable. Individual pump rates should be determined with cycle meters located within the remediation trailer, and should be converted to GPM values and recorded at each site visit.

IIB. DPE Drawdown measurement:

Prior to startup of the DPE system, a round of liquid elevations should be collected from all extraction wells and site monitoring wells as a baseline for calculation of induced drawdown. Once DPE has begun, liquid levels need not be collected from extraction wells, which are presumed to be dewatered to the pump intake, but should be collected from monitoring wells. Liquid levels should be collected at each site visit until stabilized drawdown can be demonstrated. If system configuration is altered, drawdown levels should again be verified until a steady-state condition can be verified.

IIC. DPE Wellhead air flow rates and vacuum monitoring:

Refer to Figure 2A for an example schematic of a typical DPE wellhead configuration. Although solid SVE piping can be utilized at the wellhead, a hose connection between underground SVE piping and casing is recommended to facilitate air flow measurement and provide flexibility for installation of valves and fittings within the well vault. Air flow can be measured with a rotameter attached to a double length of hose with camlock fittings at either end. In this manner, a single rotameter can be used to measure flow from all wells. Likewise, a quick-connect fitting is recommended for monitoring wellhead vacuum as a single gauge can be used on all extraction wells (although dedicated vacuum gauges are also acceptable).

[2] Since smear zone soils contain residual NAPL, headspace screening of soil samples collected during well installation can be used to distinguish between smear zone soils, and soils within the dissolved plume only.

IID. DPE Wellhead VOC monitoring:

VOC sampling should be performed under operating conditions, requiring a sample pump capable of defeating casing vacuum of 20" Hg (recommended). Although a variety of sample pump configurations are possible, the use of vacuum chamber/Tedlar bag combination allows positive visual evidence that the air sample is undiluted by leakage within the pump or fittings. Vapor samples should be screened in the field with a portable gas analyzer (FID preferred). VOC concentration (ppmv) should be converted to mass removal rate (Lb./day) utilizing an assumed molecular weight of 86.2 Lb./Lb.-mole (Hexane)[3].

IIE. DPE System VOC monitoring:

A pitot tube, venturi gauge, orifice plate, or other appropriate differential pressure flow measurement device should be installed on the discharge side of the vacuum blower. A hose barb or quick-connect fitting should also be installed at this location for vapor sampling upstream of effluent treatment (Thermox, if required). A matching flow measurement device should be installed to allow measurement of ambient air flow introduced to the system at the blow intake manifold. System air flow rate, VOC concentration as measured with a portable gas analyzer, mass removal rate (per method describe above), and bleed air flow rate (if any) should be recorded at each site visit. A confirmation laboratory analytical vapor sample should be collected concurrent with field screening sample to validate the portable gas analyzer readings. A Suma canister should be used for this purpose and submitted for analysis of BTEX and MTBE (if present) by Method 8020, and GOR through Method 8015, TO3, or suitable alternate. A laboratory VOC sample should be collected at least once during each 10 days of operation.

IIF. Optimizing DPE mass removal:

DPE systems allow broad flexibility and control in optimizing smear zone dewatering and remediation. The operational objective should be to maximize mass removal rate, initially for the system as a whole, and secondly from individual wells. Mass removal rate optimization approach emphasizes both air flow rate and VOC concentrations from individual wells, and considers initial limitations on mass removal which may be imposed by effluent treatment requirements. This approach is especially important in light of the short time frame of most DPE remediations (30-60 days).

All DPE wells should experience high mass removal rates at the beginning of remediation, especially if product removal is the remediation objective. If so, air flow control valves should be set 100% open initially, and baseline mass removal rates should be established for each well during the first week of operation. If a thermal oxidizer is required, air flow adjustments from individual wells should generally be deferred until no ambient bleed air is required (i.e., the BTU fuel value of the vapor effluent is less than Thermox treatment capacity). If maximum system vacuum operation is possible (i.e., no bleed air), individual air flow adjustments should be considered in the context of air flow rate comparisons between wells, and total air flow to the blower. Air flow rate adjustment decisions should be based on the following criteria:

1) If combined air flow rates from all wells are high relative to the maximum flow capacity of the blower, system vacuum should be within the mid- to lower portion of the performance curve (Figure 3). Under these operating conditions, flow and mass removal rate comparisons should be made between individual wells to evaluate whether air flow from certain wells should be restricted.

[3] (ppmv/1,000,000) * SCFM * 1440 min/day * 379 ft.^{3} air/mole * 86.2 Lb./Lb.-mole = Lb./day

Figure 4 illustrates a two well DPE scenario in which one well is completed in higher permeability soils than the other. The high permeability well (high K) will receive the majority of air flow if flow control valves for both wells are set at 100% open, or if the system is balanced on wellhead vacuum (left illustration). Overall air flow rates are high and system vacuum low under these conditions (Figure 3). However, if the flow control valve is partially closed for the high K well, the system can be balanced on flow rather than vacuum (right illustration). System air flow rate is lowered and system vacuum increases. Casing vacuum increases in the low K well, and decreases in the High K well. Changing casing vacuum may affect drawdown which, in turn, may affect flow rate, requiring further flow valve adjustment to obtain balance. Balancing the system on air flow places emphasis on low permeability wells where remediation of NAPL through volatilization will occur less rapidly than high permeability wells, thus increasing the probably that all wells in the remediation system will be adequately treated within the preferred operational period of 30-60 days.

2) Balancing on flow rate criteria alone may not be optimal if low permeability wells also have low mass removal rates, especially when dissolved phase hot-spot reduction is the remediation goal. Empirical data suggest certain smear zone soils will experience mass removal limitations (diffusion-limited SVE performance), which is usually associated with low permeability. If flow balancing does not significantly improve mass removal rate from these wells, it may be optimal to shut them down and thereby increase flow to other extraction wells in the system. In any case, where dissolved hot-spot cleanup is the remediation objective, decisions to eliminate low permeability extraction wells from the system based on mass removal rate should be shared between the remediation contractor, Chevron project manager, and CRTC support personnel.

3) Extraction wells with high air flow rate and low mass removal rate should be considered for exclusion from the DPE system. These conditions are more likely to develop when dissolved phase hot-spot reduction is the remediation goal. High flow/low mass removal rate wells lower the operating vacuum of the system, and contribute little to overall system performance. It is important to note that high flow/low mass removal rate wells may be experiencing short-circuiting, especially if VOC concentrations drop markedly within the first few day of operation. A study of over 70 SVE pilot tests (Peargin and Mohr, 1994) noted short-circuiting occurred in about 20% of these tests. Since the pilot tests were performed at vacuums ranging between 2.1"- 4.6" Hg, short circuiting may be more prevalent at the high vacuums typical of MPE operation. Short circuiting may be more likely where well screen and filter pack intervals extend to within about 3 ft. of the surface. If monitoring wells are completed in this manner due to a shallow water table, DPE may not be feasible.

4) If combined air flow rates from all wells are relatively low, the blower should be operating in the high vacuum end of the performance curve (Figure 3). In this case, restricting air flow from individual wells will have little effect on system vacuum, and should result in little change in flow from other wells. No air flow adjustments are necessary.

IIG. DPE System Monitoring Schedule:

Monitoring should be performed frequently at startup, and less frequently as the system performance pattern is established. A minimum frequency of 3 site visits is recommended during the first week of operation. Two site visits are recommended during the second week, followed by a single visit per week until the end of remediation. This should be considered a minimum frequency, and can be increased for Metro Atlanta, or other site locations where travel time and accessibility permit.

NA

II. Two-Phase Extraction Systems

TPE systems use a single vacuum pump to extract both water and soil vapor through small diameter piping inserted in recovery wells. A generic system schemaic is shown in figure ____. Chevron mobile systems are equipped with either a 15 or 20 h.p. Travaini oil-sealed liquid ring vacuum pump. The liquid ring pump is connected to an air/liquid seperation tank which is under high vacuum. The tank is equipped with level controls and a Moyno progressive cavity pump to transfer liquids (and any entrained sediment) from the tank to an oil/water separator, or, settling tank, if required. Vapor effluent treatment has not been required for these systems to date. However, if necessary, vapor could be readily treated through use of a thermal oxidizer, or with vapor phase carbon following filtration for entrained sealant oil droplets. Extracted groundwater and NAPL (if present) is processed through the oil/water separator, followed by surge tank, air stripper, and final carbon polish (if necessary) prior to discharge to a POTW or surface drainage through NPDES permit.

TPE system performance monitoring is more limited than DPE systems since both vapor and liquids are extracted through a single piping system. TPE performance data include:

- ✓ Groundwater extraction rate (on a system basis)
- ✓ System operating vacuum
- ✓ System air flow rate
- ✓ System VOC concentration
- ✓ Wellhead drop tube operating vacuum
- ✓ Wellhead casing operating vacuum
- ✓ Wellhead flow control valve setting
- ✓ Wellhead bleed valve setting
- ✓ Vacuum in adjacent monitoring wells
- ✓ Drawdown in adjacent monitoring wells

These data allow for limited well-specific system adjustments, and may indicate the need to modify system piping sizes, connections, and operating practice.

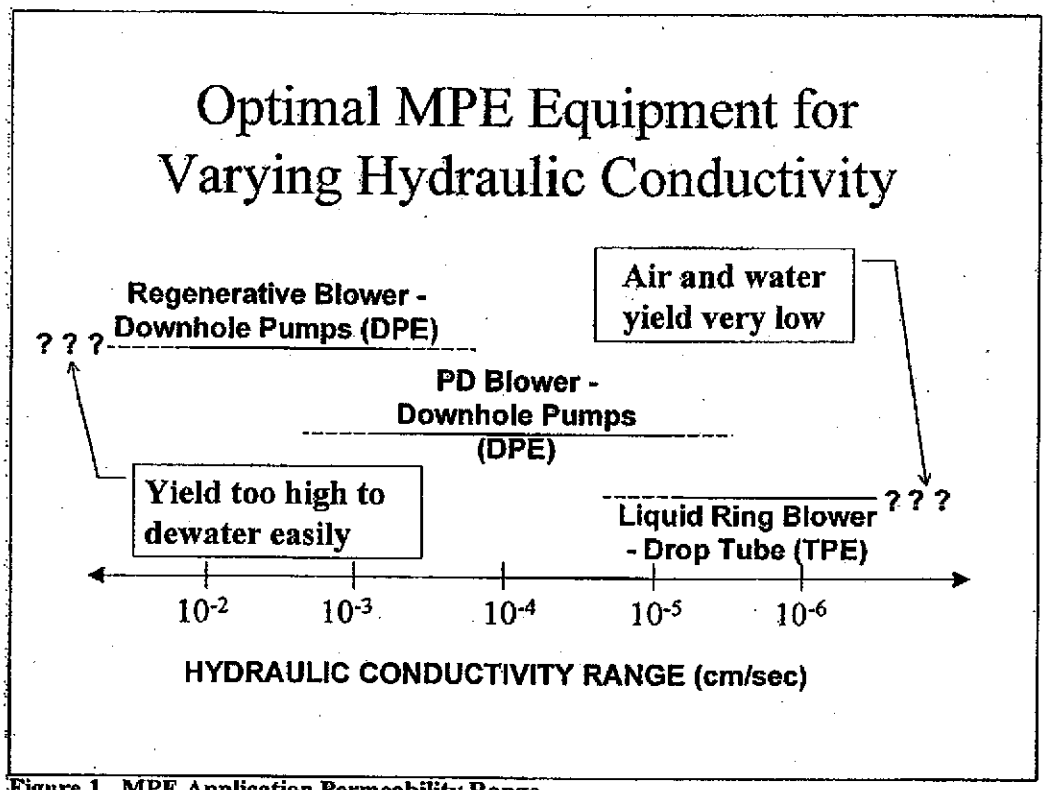


Figure 1. MPE Application Permeability Range

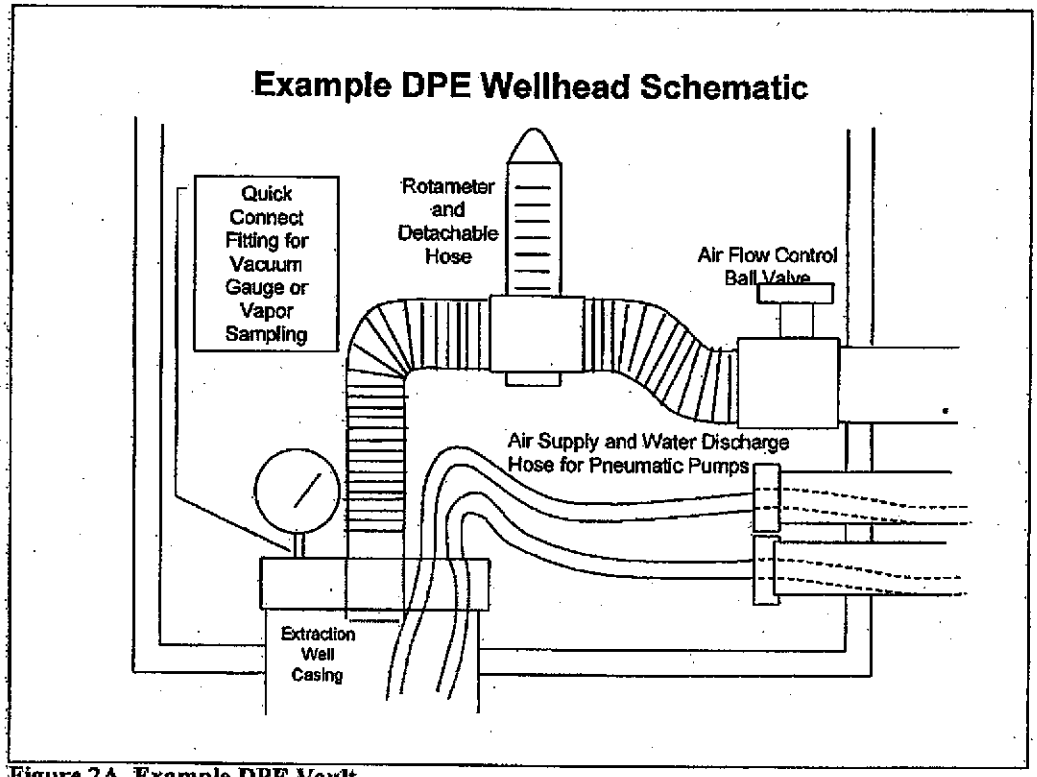


Figure 2A. Example DPE Vault

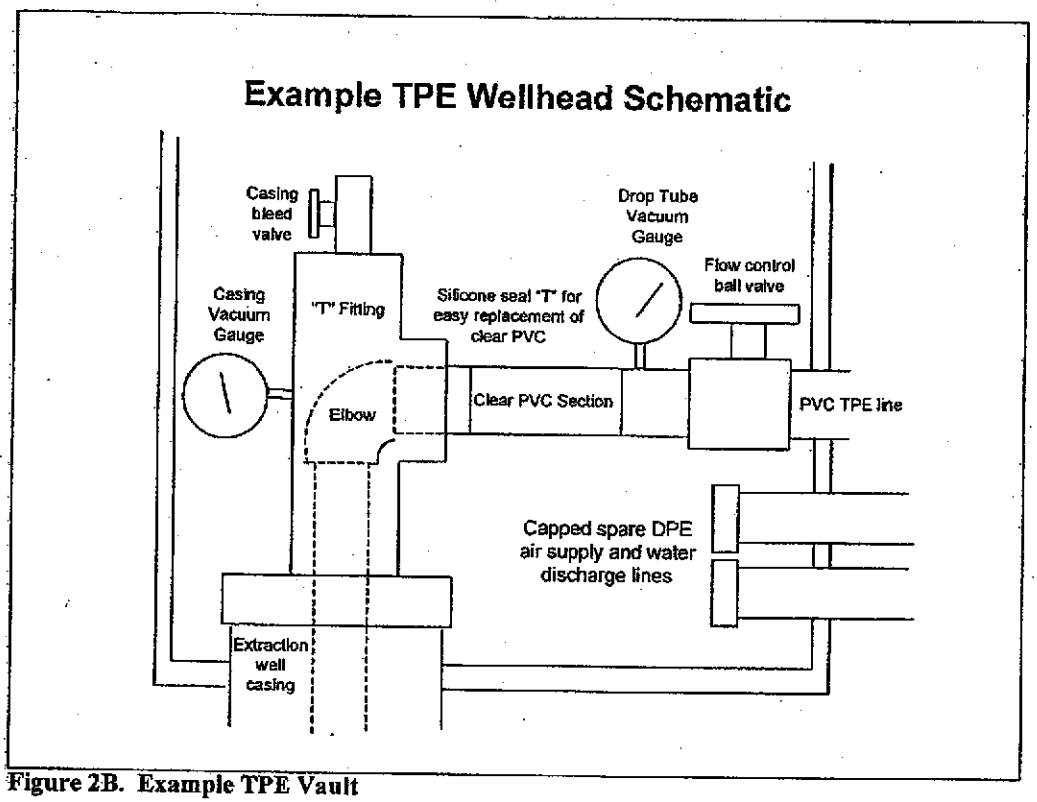


Figure 2B. Example TPE Vault

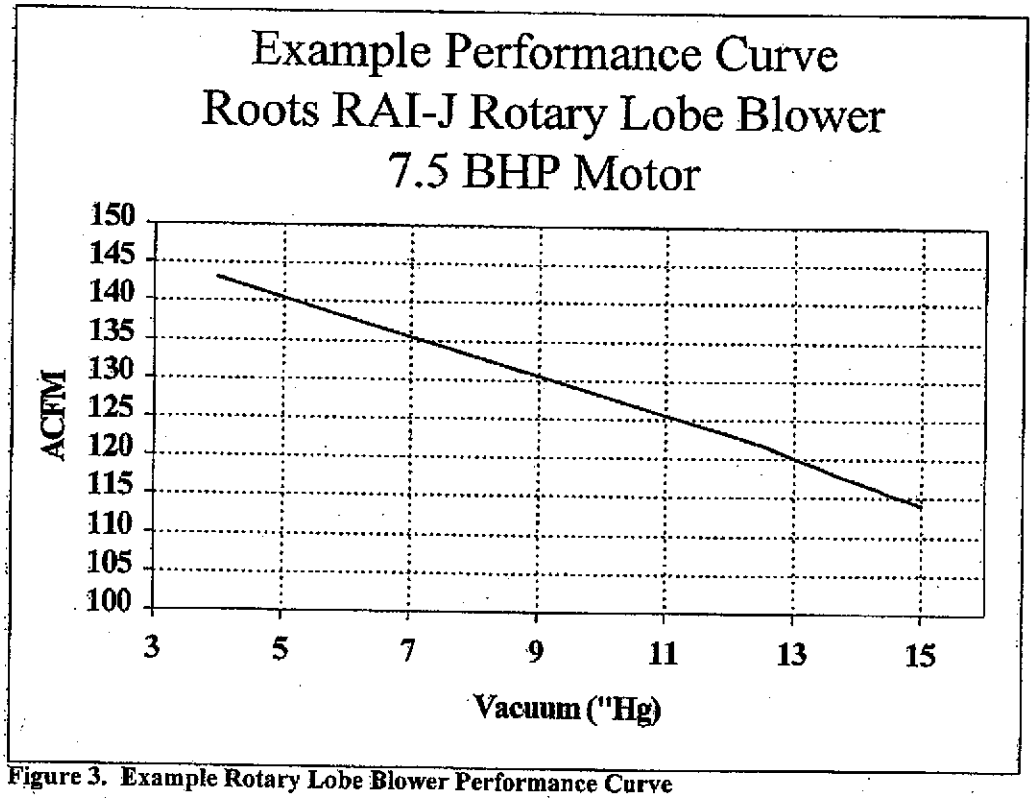


Figure 3. Example Rotary Lobe Blower Performance Curve

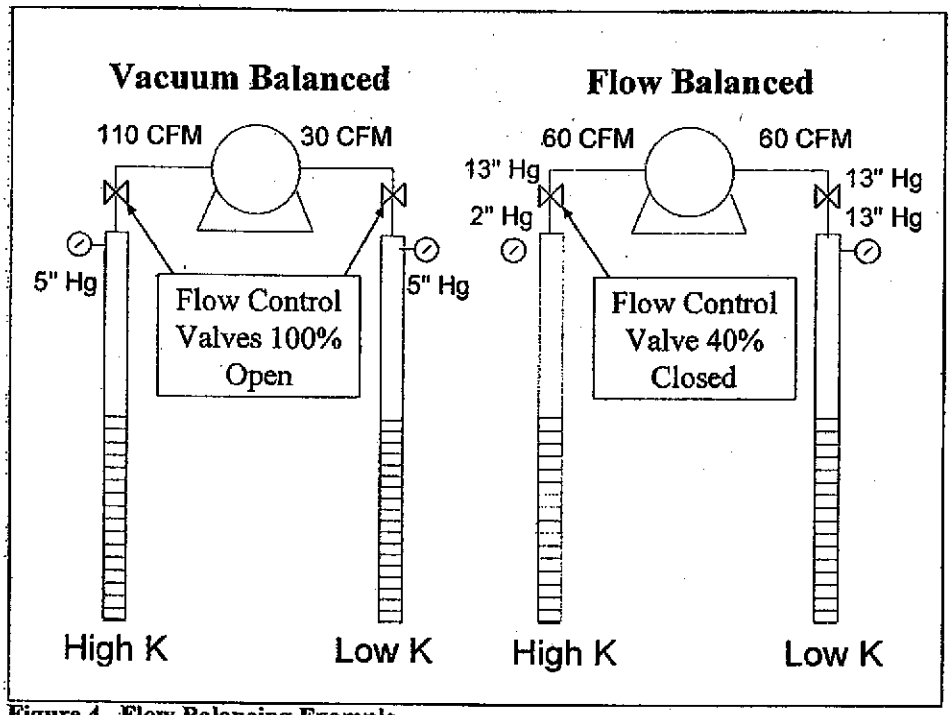


Figure 4. Flow Balancing Example

Hwang, Don, Env. Health

From: Batra, Roger [rbatra@TRCSOLUTIONS.com]
Sent: Thursday, March 17, 2005 10:17 AM
To: Hwang, Don, Env. Health
Cc: Thomas.H.Kosel@conocophillips.com; Shelby.S.Lathrop@conocophillips.com
Subject: RE: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Don,

TRC has a website, www.trcmts.com, and a lot of information regarding MTS is available on that site. Hope that will help.

Thanks,

Roger Batra
Senior Project Manager
TRC

-----Original Message-----
From: Hwang, Don, Env. Health [mailto:don.hwang@acgov.org]
Sent: Tuesday, March 15, 2005 5:40 PM
To: Batra, Roger
Subject: RE: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Roger, Do you have an SOP for the MTS? Thanks, Don

-----Original Message-----
From: Batra, Roger [mailto:rbatra@TRCSOLUTIONS.com]
Sent: Tuesday, March 15, 2005 8:59 AM
To: Hwang, Don, Env. Health
Cc: Thomas.H.Kosel@conocophillips.com; Shelby.S.Lathrop@conocophillips.com
Subject: FW: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Don,

Here is the response to your question for each site.

Thanks,

Roger Batra
TRC

-----Original Message-----
From: Trevor, Mark
Sent: Monday, March 14, 2005 11:12 AM
To: Batra, Roger
Subject: RE: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Here is a short paragraph on DPVE application at each site.

3135:
Dissolved-phase hydrocarbon concentrations in the target well (MW-6) have been 1,000 to 8,000 ug/L during the last 4 monitoring events. Prior to that, concentrations were in the 10,000 to 30,000 ug/L range. Depth to groundwater is approximately 6 fbg and the soil in the vadose zone consists of well graded sand. The high concenrations in a localized area,

combined with shallow groundwater and permeable soil make this location a good candidate for short-term dual-phase extraction. It is anticipated that vapor-phase hydrocarbons will be removed from the vadose zone and possibly from the saturated zone if water levels can be lowered. In addition, hydrocarbon-impacted groundwater will be removed from the subsurface. Dissolved-phase hydrocarbon concentrations may be lowered significantly at relatively little expense using this technology.

0746:
Dissolved-phase hydrocarbon concentrations in the target wells (MW-3, MW-5 and RW-1) have been on the order of several thousand ug/L with free-product in MW-5. Benzene and MTBE have also been detected in MW-3 and RW-1. Depth to groundwater is approximately 10 fbg and the soil in the vadose zone consists of fine to medium grained fill or clay. The soil in the water bearing zone is coarse-grained gravel and sands. The high concenrations in a localized area, combined with shallow groundwater and a coarse-grained water-bearing zone make this site a potentially good candidate for short-term dual-phase extraction. It is anticipated that dissolved- and vapor-phase hydrocarbons will be removed from the saturated zone and to a lesser extent from the fine-grained vadose zone soils. In addition, hydrocarbon-impacted groundwater will likely be removed from the subsurface.

5043:
Dissolved-phase hydrocarbon concentrations in the target well (MW-6) have been 71,000 to 110,000 ug/L during the last 4 monitoring events.
Concentrations have been consistent with this for the past 4 years.
Depth to groundwater is approximately 2 fbg and the soil in the upper 7 feet consists of sandy clayey fill. The high concenrations in a localized area, combined with shallow groundwater and semi-permeable soil make this location a good candidate for short-term dual-phase extraction. A DPVE event conducted in 1999 on MW-6 removed approximately 300 pounds of vapor-phase hydrocarbons and appeared successful at removing the recurring free-product in MW-6. It is anticipated that vapor-phase hydrocarbons will be removed from the vadose zone and possibly from the saturated zone if water levels can be lowered.

-----Original Message-----
From: Batra, Roger
Sent: Friday, March 11, 2005 11:50 AM
To: Trevor, Mark
Subject: FW: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Mark,

Please see me regarding a response to Don Hwang at Alameda County. I would like to get a response to him by Monday.

Thanks,

Roger
-----Original Message-----
From: Hwang, Don, Env. Health [mailto:don.hwang@acgov.org]
Sent: Friday, March 11, 2005 11:12 AM
To: Batra, Roger
Subject: RE: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Roger,

I've reviewed Work Plans for Dual Phase Vacuum Extraction Pilot Test for 0746 (3943 Broadway) and 5043 (449 Hegenberger Road), but can't find 3135 (6535 San Leandro Street) because we have it listed under a different address, do you have another address and which address should

be used? The Work Plans are similar, specs for the MTS are given & which well will be used. For each site, please state how your proposals have a reasonable expectation to be effective.

Don

-----Original Message-----
From: Batra, Roger [mailto:rbatra@TRCSOLUTIONS.com]
Sent: Tuesday, March 08, 2005 3:17 PM
To: Hwang, Don, Env. Health
Subject: FW: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California

Don,

Here it is. I did not have the period between your first and last name. Thanks.

Roger Batra
TRC
925-688-2466

> -----Original Message-----
> From: Batra, Roger
> Sent: Tuesday, March 08, 2005 2:37 PM
> To: 'donhwang@acgov.org'
> Cc: 'Thomas.H.Kosel@conocophillips.com'; 'Shelby.S.Lathrop@conocophillips.com'
> Subject: 76 Stations 0746 (3943 Broadway), 3135 (6535 San Leandro Street), and 5043 (449 Hegenberger Road), Oakland, California
>
>
> Don,
>
> TRC on behalf of ConocoPhillps Company (ConocoPhillips) had submitted the following documents for the subject sites to Alameda County Health Services in September/October 2004.
>
> 76 Station No. 0746, 3943 Broadway, Oakland, California
>
> Work Plan for Dual Phase Vacuum Extraction Pilot Test dated September 23, 2004.
>
> 76 Station No. 3135, 6535 San Leandro Street, Oakland, California
>
> Work Plan for Dual Phase Vacuum Extraction Pilot Test dated September 23, 2004.
>
> 76 Station No. 5043, 449 Hegenberger Road, Oakland, California
>
> Work Plan for Dual Phase Vacuum Extraction pilot Test dated October
> 11, 2004
>
> TRC has scheduled the pilot tests at these sites to take place in late March/early April 2005. The pilot tests will be conducted using TRC's Mobile Treatment System, a truck-mounted, dual-phase soil-vapor and liquid extraction system. In addition, prior to commencement of onsite work, TRC will notify the Bay Area Air Quality Management District of the proposed activities.
>
> No comments have been received from Alameda County Health Services
> since the submittal of the Work Plans for the subject sites. In
> accordance with 60-day rule (CCR Title 23, Division 3, Chapter 16,
> Article 11, Section 2722, 2e), TRC on behalf of ConocoPhillips can
> proceed with the dual-phase vacuum extraction pilot tests at the
> subject sites. If we do not hear back from you by March 18, 2005 we

> will assume you have no objections to the implementation of the
> aforementioned Work Plans
>
> Please call me should you have any questions or need additional
information.
>
> Thanks,
>
> Roger Batra
> Senior Project Manager
> TRC
> 1590 Solano Way, Suite A
> Concord, California 94520
> 925-688-2466 (Direct)
> 925-260-6405 (Cell)
>

Hwang, Don, Env. Health

From: Lathrop, Shelby Suzanne [Shelby.S.Lathrop@conocophillips.com]
Sent: Thursday, March 03, 2005 4:07 PM
To: Hwang, Don, Env. Health
Subject: ConocoPhillips, point of contact change

Hello, I'm replacing Thomas Kosel as the ConocoPhillips point of contact for the following locations:

Site 4625, 3070 Fruitvale Ave., Oakland
Site 7176, 7850 Amador Valley Road, Dublin
Site 0746, 3943 Broadway, Oakland
Site 5043, 449 Hegenberger Road, Oakland
Site 6419, 6401 Dublin Blvd, Dublin

Please call with any questions; thanks.

Also, I've received a copy of your letter dated 2/9/2005 for site 4625 from Mr. Kosel and have noted comments and requirements. Thanks!

Shelby S. Lathrop

Shaw Environmental, Inc.
Approved service provider of ConocoPhillips - Risk Management & Remediation

Client Contact Information:
76 Broadway
Sacramento, CA 95818
(916) 558-7609
fax (916) 558-7639

R203

GETTLER-RYAN INC.

1364 North McDowell Blvd. Suite B2
Petaluma, CA 94954
Phone (707) 789-3255, Fax (707) 789-3218

TRANSMITTAL

TO: Ms. Eva Chu
Alameda County HCS
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

DATE: June 26, 2003
PROJECT NO. 140064.1
Subject: ConocoPhillips (76) Station 0746
Oakland, California

From: Jeremy Smith

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	6/24/03	Summary of Environmental Activities

THESE ARE TRANSMITTED as checked below:

- ☐ For review and comment
- ☐ As Requested
- ☒ For Approval
- ☐ Approved as submitted
- ☐ Approved as noted
- ☐ Returned for corrections
- ☐ For your files
- ☒ For your use
- ☐ As noted below

COMMENTS:
Eva
Attached is a summary of environmental activities completed at the subject site. Please call with questions. Thanks

Signed: _____

COPIES TO: Dave DeWitt, ConocoPhillips
76 Broadway, Sacramento, CA 95818

R203

GETTLER-RYAN INC.

June 24, 2003

Alameda County
JUL 0 3 2003
Environmental Health

Ms. Eva Chu
Alameda County Health Care Services Agency
1131 Harbor bay Parkway
Alameda, CA 94502

Subject: **Summary of Completed Environmental Activities for Tosco (76) Service Station No. 0746, 3943 Broadway, Oakland, California.**

INTRODUCTION

At the request of ConocoPhillips, Gettler-Ryan Inc. (GR) has prepared the following summary of environmental activities performed at the site to date and recommends an interim remedial action. This summary has been prepared in response to the request by Alameda County Health Care Services for an update on environmental activities at the site.

SITE DESCRIPTION

The subject site is situated on the western corner of the intersection of Broadway and 40th Street in Oakland, California (Figure 1). Station facilities include two 12,000-gallon double-wall glasteel gasoline underground storage tanks (USTs) in a common pit, one 520-gallon double-wall glasteel waste oil UST, two dispenser islands, one station building, and a car wash building. Locations of the pertinent site features are shown on Figure 2. To date, twelve groundwater monitoring wells (MW-1 through MW-12) and one groundwater extraction well (RW-1) have been installed at the site.

PREVIOUS ENVIRONMENTAL ACTIVITIES

The following summarizes the previous environmental activities performed at the subject site.

- In August 1989, two 10,000-gallon steel gasoline USTs and one 280-gallon steel waste oil UST were removed and replaced with the current USTs. Six soil samples were collected from the sidewalls of the gasoline UST cavity and analyzed for total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylenes (BTEX). Hydrocarbon concentrations were reported as non detect in three of the five samples, the remaining two were reported as containing a maximum concentration of 290 parts per million (ppm) for TPHg and 0.82 ppm for benzene. Soil around these two samples was over excavated to accommodate room for the new, larger USTs. The confirmatory soil sample was reported as non detect for all

constituents. A total of approximately 350 cubic yards of soil was removed from the site during UST removal activities.

The product piping was also removed at this time, and four soil samples were collected from beneath the product lines. Hydrocarbon concentrations ranged from 3.8 ppm to 36 ppm for TPHg and from not detect to 0.52 ppm for benzene. One soil sample was collected from beneath the waste oil UST and analyzed for total oil and grease (TOG) in addition to TPHg and BTEX. Concentrations for these analytes were reported as non detect except for TPHg (1.6 ppm) and toluene (1.3 ppm).

During the tank removal activities, approximately 1,500-gallons of groundwater was pumped from the UST cavity and a groundwater sample was collected and analyzed for TPHg and BTEX. Concentrations for TPHg and benzene were reported as 4,700 parts per billion (ppb) and 180 ppb, respectively. Subsequently, approximately 5,000 additional gallons of groundwater were removed from the UST cavity and a second groundwater sample was collected. Concentrations for TPHg and benzene were reported as 1,200 ppb and 12 ppb, respectively.

- On October 17, 1989, three monitoring wells (MW-1 through MW-3) were installed at the site at depths ranging from 20 to 22.5 feet below ground surface (bgs). Soil samples were collected and analyzed for TPHg and BTEX. TPHg concentrations were detected up to 1,100 ppm, and benzene concentrations up to 16 ppm.

- On January 26, 1990, two additional monitoring wells (MW-4 and MW-5) were installed at the site to a depth of 20 feet bgs. Soil samples were analyzed for TPHg and BTEX. TPHg concentrations ranged from 2.5 ppm to 370 ppm, and benzene concentrations ranged from non detect to 1.8 ppm.

- On October 23, 1990, four additional monitoring wells (MW-6 through MW-9) were installed at and in the vicinity of the site at depths ranging from 20 to 22 feet bgs. Soil samples were analyzed for TPHg and BTEX. TPHg concentrations ranged from 11 ppm to 120 ppm, and benzene concentrations ranged from non detect to 0.32 ppm.

- On October 22, 1991, groundwater recovery tests were performed on wells MW-3, MW-5, MW-8, and MW-9 to determine potential locations for placement of recovery wells.

- On January 7, 1992, two offsite monitoring wells (MW-10 and MW-11) were installed in the vicinity of the site at depths ranging from 19 to 22 feet bgs. Soil samples were analyzed for TPHg and BTEX. TPHg and benzene concentrations were reported as non detect for all samples analyzed.

- On June 25, 1992 one recovery well (RW-1) and one additional offsite monitoring well (MW-12) were installed at the site to depths of 17.5 feet bgs. Soil samples were collected from MW-12 and analyzed for TPHg and BTEX. Concentrations were reported as non detect for all constituents.

- On April 12 through April 16, 1993, a pilot vapor extraction test was performed at the site on well RW-1. A maximum concentration of 8.6 ppb TPHg was reported in the influent vapor stream. The calculated maximum hydrocarbon extraction rate during the test was 0.00049 lbs/hr. Based on the low extraction rate, high groundwater levels, and fine-grained soil beneath the site, vapor extraction was determined to not be a feasible remedial option. Well RW-1 was initially installed to perform a groundwater recovery test, but due to lack of groundwater recharge, the test was not performed.

- On February 19, 1998, the product piping and associated dispenser islands were replaced at the site. A total of four soil samples were collected from beneath the dispenser islands. Petroleum hydrocarbons were not detected in one of the soil samples. Petroleum hydrocarbon concentrations were reported in the remaining three soil samples at up to 4,300 ppm of TPHg, up to 0.039 ppm of benzene, and up to 2.9 ppm of methyl tertiary butyl ether (MtBE). Soil excavated from the product line trenches was stockpiled at the site. A total of 30.20 tons of stockpiled soil was transported from the site by Denbeste Transportation, Inc. of Windsor, California to the Forward Inc. Landfill in Stockton, California for disposal on March 3, 1998.

GROUNDWATER SAMPLING

Groundwater samples have been collected quarterly, semi-annually, or annually at the site since 1989. Monitoring wells MW-2, MW-6, MW-10, and MW-12 have not been sampled since November 1995 per a letter to Tosco from the Alameda County Health Care Services dated January 24, 1996. During the most recent sampling event on November 29, 2002 TPHg was reported as non detect in each well with the exception of MW-3 (5,300 ppb). Benzene was not detected during the sampling event, and MtBE concentrations were reported up to 340 ppb. The groundwater flow direction during the November 29, 2002 monitoring and sampling event was toward the southwest at a gradient of 0.01 to 0.05 ft./ft which is consistent with the historical groundwater flow direction.

Separate phase hydrocarbons (SPH) were detected in well MW-5 at a thickness of 0.05 feet during the November 29, 2002 monitoring and sampling event. Monthly monitoring and product removal events have been performed on MW-5 since November 1998, and a total of

approximately 14 gallons of groundwater/product have been removed since that time. A product skimmer was installed in well MW-5 in February 2001 and is currently operating in the well. Historically the SPH thickness in well MW-5 has ranged from non detected to 0.67 feet. During monthly monitoring and product removal events in 2002, the SPH thickness in MW-5 has ranged from 0 to 0.31 feet. SPH was occasionally detected in well MW-3 from December 1992 through October 1994 at a maximum thickness of 0.03 feet. SPH has not been detected in the other wells at or in the vicinity of the site.

CONCLUSION AND RECOMMENDATIONS

Dissolved hydrocarbons beneath the site have been delineated and appear to be concentrated in the southern portion of the site. Offsite wells MW-8 through MW-12 have been predominately free of hydrocarbons since 1999. A total of approximately 6,514 gallons of groundwater and approximately 369 cubic yards of soil have been removed from the site to date. Based on historical testing, no remedial systems are a feasible option for remediation at the site. GR recommends that a groundwater purging program be initiated at the site. Wells MW-3, MW-5, and RW-1 should be purged to address the presence of SPH in well MW-5 and to reduce dissolved concentrations in the vicinity of MW-3. Additionally well RW-1 should be sampled on an annual basis.

REFERENCES

Gettler-Ryan Inc., 2003, Groundwater Monitoring and Sampling Report, Second Semi-Annual Event of November 29, 2002, dated January 3, 2003.

..., 1998, Product Piping Replacement Report for Unocal Service Station No. 0746, June 18, 1998.

Kaprealian Engineering, Inc., 1993, Pilot Vapor Extraction Test Report, Unocal Service Station #0746, 3943 Broadway, Oakland, California, dated May 18, 1993.

..., 1992, Continuing Ground Water Investigation and Quarterly Report, Unocal Service Station #0746, 3943 Broadway, Oakland, California, dated September 25, 1992.

If you have any questions regarding this report, please call us at (707) 789-3255.

Sincerely,
Gettler-Ryan Inc.

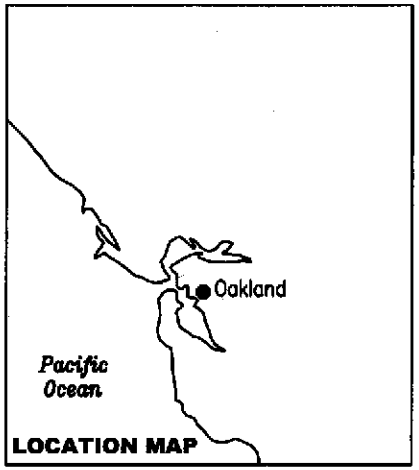
Jeremy Smith
Staff Geologist

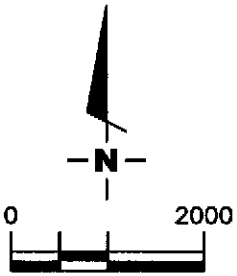
Robert C. Mallory
Registered Geologist
R.G. No. 7285

REGISTERED GEOLOGIST
ROBERT C. MALLORY
No. 7285
Exp. 9/04
STATE OF CALIFORNIA

Attachments: Figure 1. Vicinity Map
Figure 2. Site Plan

cc: Mr. David De Witt, ConocoPhillips





Source: National Geographic California Seamless USGS Topographic Maps on CD-ROM.

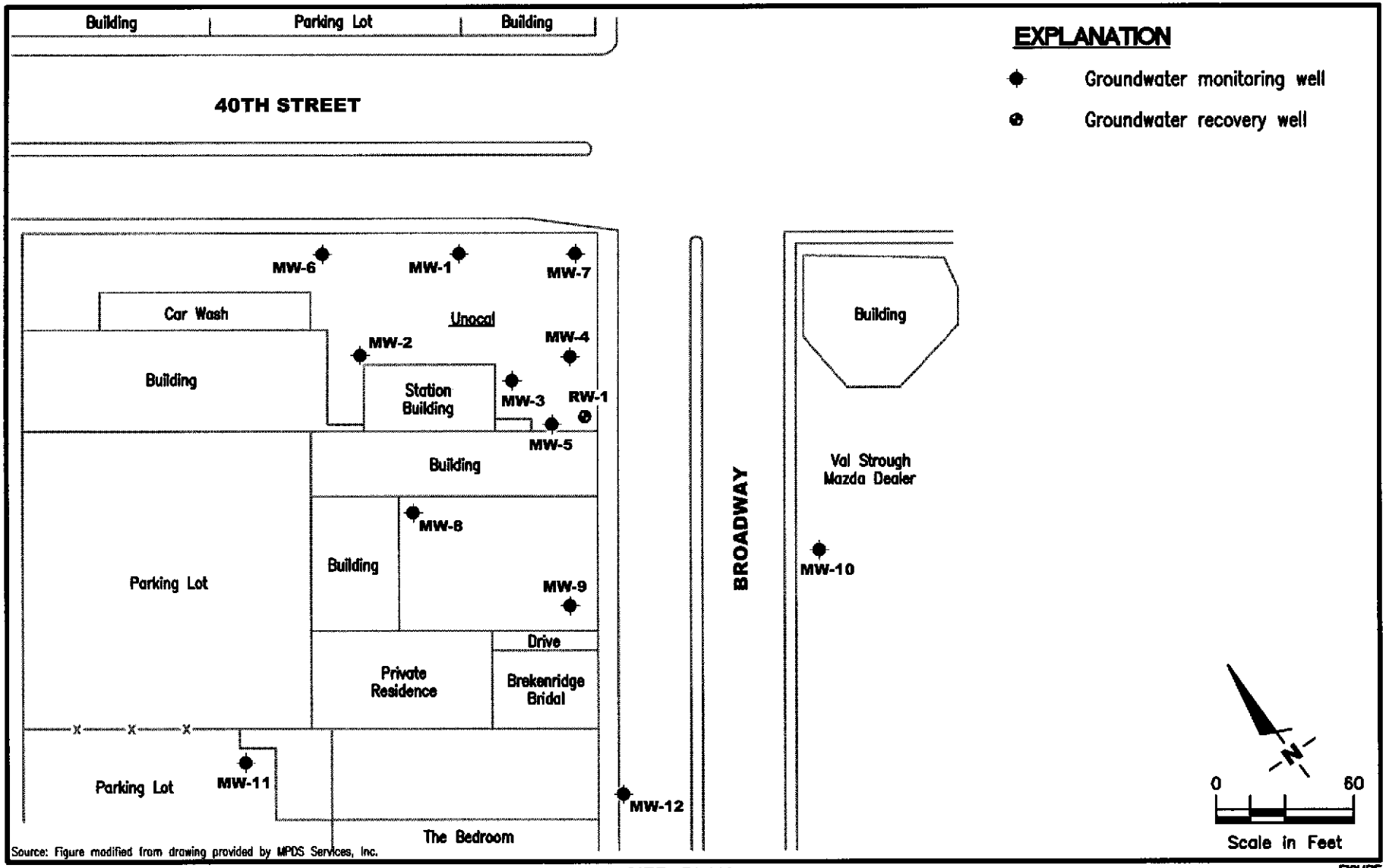
GETTLER - RYAN INC.
6747 Sierra Ct., Suite J
Dublin, CA 94568 (925) 551-7555

VICINITY MAP
Tosco (76) Service Station #0746
3943 Broadway
Oakland, California

FIGURE
1

PROJECT NUMBER	REVIEWED BY	DATE	REVISED DATE
140064		5/03	

FILE NAME: P:\ENVIRO\TOSCO\0746\VIC-0746.DWG | Layout Tab: Vic Map



Source: Figure modified from drawing provided by MPDS Services, Inc.

GETTLER - RYAN INC.
6747 Sierra Ct., Suite J
Dublin, CA 94568 (925) 551-7555

SITE PLAN
Tosco (76) Service Station #0746
3943 Broadway
Oakland, California

FIGURE
2

PROJECT NUMBER	REVIEWED BY	DATE	REVISED DATE
140064.01		5/03	

FILE NAME: P:\ENVIRO\TOSCO\0746\A03-0746.DWG | Layout Tab: Summary Rpt. 5-03

Chu, Eva, Env. Health

From: DeWitt, David:[SMTP:ddewitt@tosco.com]
Sent: July 18, 2001 1:44 PM
To: 'Chu, Eva, Env. Health'
Cc: 'Lee, Doug'
Subject: RE: Tosco SS #0746, 3943 Broadway, Oakland, CA

Eva:
I have looked at this one in detail and still don't have any good ideas of why we continue to see free product. I do not see a correlation between the water table and the occurrence of free product (the normal relationship). With regard to your question on a new release, I would not classify the free product as the result of a new "release" based upon one fact - the lack of significant levels of MtBE. If there is something that would show up, particularly in the groundwater, it will be the MtBE. Another thing that puzzles me is that in sampling periods where there is no free product, the dissolved hydrocarbons are high but not even close to what would be expected from water in equilibrium with free product (yes, I know the analytical for the 5-22-00 sampling for MW-5 is not normal). This lack of correlation between dissolved hydrocarbons and FP suggest (but do not prove) that the FP and the groundwater are isolated. We do not see evidence of FP migrating to other wells so it appears that the FP is restricted to a small area.

What are we going to do about it? Good question. I think the first thing to do is to check the water in RW-1 and see if FP is there. If there is, install a skimmer. It appears that FP recharge is quite slow so an active system is not efficient. I think it would also be useful to find out what the FP is. In other sites, the material is almost "goo" because it is weathered so much.
> -----Original Message-----
> From: Chu, Eva, Env. Health [SMTP:EChu@co.alameda.ca.us]
> Sent: Tuesday, July 17, 2001 5:27 PM
> To: 'DeWitt, David:'
> Subject: RE: Tosco SS #0746, 3943 Broadway, Oakland, CA
>
> Reviewed the June 2001 QMR for the site. In May 2001 there was 6 oz. of
> free product in the skimmer. Do you think there was a recent release at
> the
> site? If so, a ULR needs to be filed, etc. Please let me know what you
> find.
>
> evachu
>
> Alameda County Environmental Health
> 1131 Harbor Bay Parkway
> Alameda, CA 94502
> (510) 567-6762
> (510) 337-9335 fax
>
> > ----------
> > From: DeWitt, David:[SMTP:ddewitt@tosco.com]
> > Sent: February 16, 2001 3:02 PM
> > To: 'Chu, Eva, Public Health, EHS'
> > Subject: RE: Tosco SS #0746, 3943 Broadway, Oakland, CA
> >
> > Eva:
> > Don't know if I read your mind or not, but the skimmer went back onto
> the
> > well earlier this week. We bailed some free product, but I don't know
> > right
> > off hand how much it was. It will be summarized in the QM for you.
> >
> > > -----Original Message-----

> > > From: Chu, Eva, Public Health, EHS [SMTP:EChu@co.alameda.ca.us]
> > > Sent: Friday, February 16, 2001 9:27 AM
> > > To: 'DeWitt, David:'
> > > Subject: Tosco SS #0746, 3943 Broadway, Oakland, CA
> > >
> > > Hi Dave,
> > >
> > > I reviewed the most recent quarterly monitoring report for the above
> > > referenced site. It looks like product thickness in well MW-5 was at
> > 0.67
> > > feet. This is a considerable increase in product thickness. Has
> there
> > > been
> > > an incident at the site that I should be aware of? The report also
> said
> > > that no skimmer was found in this well.
> > >
> > > Please have a product skimmer placed back into Well MW-5 until product
> > > thickness decrease to an unmeasurable thickness. And have the product
> > > skimmer checked on a monthly basis to verify that a recent fuel
> release
> > > has
> > > not occurred at the site. Quarterly product removal reports should be
> > > submitted until there is not much more to report.
> > >
> > > Thanks for looking into this site.
> > >
> > >
> > > evachu
> > >
> > > Alameda County Environmental Health
> > > 1131 Harbor Bay Parkway
> > > Alameda, CA 94502
> > > (510) 567-6762
> > > (510) 337-9335 fax
> >

Chu, Eva, Public Health, EHS 2/16/01

To: DeWitt, David:
Subject: Tosco SS #0746, 3943 Broadway, Oakland, CA

Hi Dave,

I reviewed the most recent quarterly monitoring report for the above referenced site. It looks like product thickness in well MW-5 was at 0.67 feet. This is a considerable increase in product thickness. Has there been an incident at the site that I should be aware of? The report also said that no skimmer was found in this well.

Please have a product skimmer placed back into Well MW-5 until product thickness decrease to an unmeasurable thickness. And have the product skimmer checked on a monthly basis to verify that a recent fuel release has not occurred at the site. Quarterly product removal reports should be submitted until there is not much more to report.

Thanks for looking into this site.

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

StID 1119

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700

March 12, 1999

Mr. Dave DeWitt
Tosco
2000 Crow Canyon Place, Suite 400
San Ramon, CA 94583

RE: Groundwater Analysis at 3943 Broadway, Oakland, CA

Dear Mr. DeWitt:

I have completed review of Gettler-Ryan Inc.'s February 1999 *Semi-Annual 1998 Groundwater Monitoring & Sampling Report* prepared for the above referenced site. This report summarized analytical results of groundwater samples collected on November 11, 1998. Free product thickness in well MW-5 has increased from a sheen in May 1998 to 0.37' in November. Please verify that there has not been a recent fuel release at the site. In addition, a free product removal program should be implemented to minimize the spread of contamination into previously uncontaminated zones. Free product removal reports must be prepared in compliance with Section 2655 of Article 5, Title 23 of the California Code of Regulations and be submitted within 45 days upon completion of interim remediation.

As a reminder, the following additions are required for the next sampling event:

- Confirm MTBE and other oxygenates using EPA Method 8260 in samples which indicate the presence of MTBE (with Method 8020).
- Well MW-8 must be made accessible for sampling.
- Well MW-11 should also be sampled.
- A risk assessment to determine site specific target levels is due for review (see enclosed letter).

If you have any questions, I can be reached at (510) 567-6762.

eva chu
Hazardous Materials Specialist

c: Deanna Harding, Gettler-Ryan, 6747 Sierra Court, Suite J, Dublin, CA 94568

unocaloak1-7

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
(510) 337-9335 (FAX)

StID 1119

August 12, 1998

Ms. Tina Berry
Tosco
2000 Crow Canyon Place, Suite 400
San Ramon, CA 94583

RE: Risk Assessment at 3943 Broadway, Oakland, CA

Dear Ms. Berry:

Thank you for the submittal of the "Semi-Annual 1998 Groundwater Monitoring & Sampling Report" dated July 23, 1998 for the above referenced site. Groundwater from monitoring well MW-5 continues to identify elevated benzene concentrations. The well is located at the property line.

The contaminant plume has migrated beneath the adjacent and downgradient property. At this time, a risk assessment is necessary to determine if BTEX constituents pose a human health risk for workers/residents at the adjacent property. Site specific target levels should be established so a determination can be made if active remediation is necessary at the site. The risk analysis is due to this office by **October 14, 1998.**

The next sampling event should be in November 1998. If MTBE is detected in any of the groundwater samples, please **confirm MTBE by using Method 8260.** and other oxygenates

If you have any questions, I can be reached at (510) 567-6762.

eva chu
Hazardous Materials Specialist

unocaloak1-6

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

RAFAT A. SHAHID, DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
1131 Harbor Bay Parkway
Alameda, CA 94502-6577
(510) 567-6777

April 22, 1996

Mr. Ed Ralston
UNOCAL
P.O. Box 5155
San Ramon, CA 94583

RE: Use of ORC in Groundwater Monitoring Wells

Dear Mr. Ralston:

I have received information from Regenesis, who developed the Oxygen Release Compound (ORC) remediation technology, that it is not recommended to purge monitoring wells with ORC prior to sampling. Purging would remove dissolved oxygen, thus defeating the purpose of using ORC.

Several UNOCAL sites are currently using ORC in some of the groundwater monitoring wells. Those wells which have ORC installed should not be purged prior to sampling. Sites employing ORC are:

1. Unocal Service Station # 5366, at 7375 Amador Valley Blvd, Dublin (StID 3169);
2. Unocal Service Station #6419, at 6401 Dublin Blvd, Dublin (StID 2096);
3. Unocal Bulk Plant #0490, at 3357 Gardella Plaza, Livermore (StID 3376); and
4. Unocal Service Station #0746, at 3943 Broadway, Oakland (StID 1119).

If you have any questions, I can be reached at (510) 567-6762.

eva chu
Hazardous Materials Specialist

c: files (StID 3169, 2096, 3376, 1119)

unocal.orc

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ARNOLD PERKINS, DIRECTOR
RAFAT A. SHAHID, DEPUTY DIRECTOR

Alameda County Environmental Health Dept.
Environmental Protection Division
1131 Harbor Bay Parkway, Room 250
Alameda CA 94502-6577
(510)567-6700 fax: (510)337-9335

StID 1119

January 24, 1996

Mr. Ed Ralston
Unocal
2000 Crow Canyon Pl, Suite 400
San Ramon, CA 94583

RE: Reduced Sampling Frequency at Unocal Service Station 0746, 3943 Broadway, Oakland 94611

Dear Mr. Ralston:

I have completed review of mpds' December 1995 Quarterly Data Report for the above referenced site. It appears appropriate at this time to further reduce the sampling frequency of certain wells. The following schedule may be implemented as soon as practical:

1. Discontinue sampling of wells MW-2, MW-6, MW-7, MW-10, MW-11, and MW-12;
2. Sample semi-annually wells MW-1, MW-3, MW-4, MW-5, MW-8 and MW-9.

If you have any questions, I can be reached at (510) 567-6762.

eva chu
Hazardous Materials Specialist

cc: Nubar Srabian, mpds, 2401 Stanwell Dr, #300, Concord 94520
files

Bc

unocal01.5

Unocal Corporation
2000 Crow Canyon Place, Suite 400
San Ramon, California 94583
Telephone (510) 867-0760
Facsimile (510) 277-2309

UNOCAL 76

February 15, 1995

North Region
Corporate Environmental Remediation & Technology

Ms. Eva Chu
Alameda County Health Care
Services Agency
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

SUMMARIZATION OF MEETING ON JANUARY 25, 1995

Unocal Service Station No. 5366
7375 Amador Valley Boulevard
Dublin, California

Unocal Service Station No. 6419
6401 Dublin Boulevard
Dublin, California

Unocal Service Station No. 0746
3943 Broadway
Oakland, California

Dear Ms. Chu:

This letter has been prepared in order to summarize the items discussed and agreed to in our January 25, 1995 meeting, pertaining to the three referenced sites. However, before proceeding with the summary, I would again like to thank you for taking the time and discussing the work that has been performed at the referenced sites. I have found that these face-to-face meetings are usually successful in resolving environmental concerns and encourage them whenever possible. The Unocal service station locations and the agreements reached at each location are as follows:

I. Unocal Service Station #5366, Dublin, California

DISCUSSION

- The underground storage tanks were replaced in 1988. Hydrocarbon-impacted soil was overexcavated in the vicinity of the tank pit. The extent of overexcavation was limited to the northwest due to the proximity of the dispenser islands. Groundwater was also encountered and approximately 9,000 gallons of contaminated groundwater were pumped from the open tank excavation.

- Soil assessment conducted during tank replacement activities and monitoring well installation indicates that soil contamination is localized. Soil contamination is limited to the vicinity of the southern-most pump island and the capillary fringe in the vicinity of MW5.

- Five monitoring wells have been installed at the site. The extent of groundwater contamination is limited to the southeast portion of the Unocal site. Groundwater investigations are also currently in progress at four nearby sites (Arco, Shell, BP, and Dutch Pride). Unocal has initiated joint monitoring with the adjacent PRP's (Arco, Shell and BP). It is Unocal's understanding that no active remediation is currently being performed at any of these sites.

- In response to your request, our consultant (KEI) investigated the positioning of the sewer mains in the vicinity of the site as potential conduits for off-site migration. Information obtained from the Dublin-San Ramon Services District indicates that the sewer main within the intersection of Village Parkway and Amador Valley Boulevard is approximately 18 feet below grade. The depth to groundwater in the vicinity is approximately 10 feet below grade, thus, the sewer main is below the groundwater table. Investigation of the sewer main trenches is not viable and presents a significant risk of damaging the sewer line. Exact locations and as built drawings are not available for the sewer lines.

CONCLUSIONS

- Historically, elevated concentrations of contaminants have been detected in the monitoring wells that are located closest to the intersection of Amador Valley Boulevard and Village Parkway (Arco - well MW3, BP - well AW6, Unocal - well MW5 and Shell - well MW6)

- Unocal will continue to review remedial options at the site as requested in your letter dated December 6, 1994. However, as discussed in our meeting, a preliminary review of remedial options, as well as past experience, indicates the lithology at the site will most likely render standard remedial techniques infeasible(i.e. pump and treat, vapor extraction, etc.). Results of our review will be submitted to you by March 15, 1995. Additionally, as we agreed, Unocal is planning the implementation of an oxygenation program by utilizing magnesium peroxide in selected monitoring wells at the site.

- Ms. Eva Chu will contact other responsible parties within the intersection area to determine if they are willing to have the area classified as a regional Non-Attainment Area.

- As discussed during the meeting, BP may be required to install a monitoring well downgradient of their site and in Village Parkway before NAA status can be granted (to be determined later).

II. Unocal Service Station #6419,Dublin, California

DISCUSSION

- The underground storage tanks were replaced in 1993. Approximately 19,000 gallons of contaminated groundwater was pumped from the open tank excavation. No significant soil contamination has been detected at the site to date.

- Three monitoring wells have been installed in the vicinity of the USTs. One well (MW1) has elevated levels of dissolved hydrocarbon constituents. A very flat ground water gradient exists at the site.

CONCLUSIONS

- An oxygen-releasing compound (magnesium peroxide) will be added to MW1 to facilitate the bioremediation process. Dissolved oxygen content will be measured in each well, during routine groundwater monitoring and sampling events.

- Send Regenesis (magnesium peroxide) information package and case study to Eva Chu (completed 1/26/95).

III. Unocal Service Station #0746, Oakland, California

DISCUSSION

- The underground storage tanks were replaced in 1989. Hydrocarbon-impacted soil was overexcavated in the vicinity of the tank pit. Groundwater was also encountered and approximately 6,500 gallons of contaminated groundwater were pumped from the open tank excavation.

- Soil assessment conducted during tank replacement activities and monitoring well installation indicates that soil contamination is relatively localized, as well as defined. Soil contamination is limited to capillary

fringe soils at and in the immediate downgradient vicinity of the site.

- A pilot vapor extraction test was performed at the site and indicated that vapor extraction was ineffective and therefore, not feasible. The lack of significant hydrocarbon extraction rates appeared to be related to the fine-grained nature of the soils.

- Twelve groundwater monitoring wells and one groundwater recovery well have been installed at and in the vicinity of the site. The extent of groundwater contamination has been defined and does not appear to be migrating. Monitoring wells MW3 and MW5 periodically show trace amounts of free product. Free product and contaminated groundwater has been purged from both wells on a biweekly basis from 1990 through 1994. Approximately, 14,200 gallons of groundwater and 28 ounces of product has been recovered. A groundwater pump test was also not feasible, due to the fine-grained nature of the subsurface soils at the site and the slow rate of recharge of the wells.

CONCLUSIONS

- Standard remedial techniques are not applicable for this site, based on the results of the pilot vapor extraction and the groundwater recovery tests performed at the site.

- Unocal is currently planning to add magnesium peroxide (Regenesis) to monitoring wells, MW3 and MW5, as agreed in our meeting. After a six-month oxygenation period, an evaluation will be made as to whether to include this site in the Non-Attainment Area (NAA) program.

- Decrease the sampling frequency of wells MW10, MW11, and MW12 to semi-annually.

Again, thank you for taking the time to meet with us to discuss the three subject sites. If you have any questions, please feel free to contact me at (510) 277-2311.

Sincerely,

Edward C. Ralston

Edward C. Ralston
Senior Environmental Geologist

cc: Rick Sisk, Unocal
Tim Ross, KEI

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

StID 1119

July 5, 1994

Mr. Ed Ralston
UNOCAL
P.O.Box 5155
San Ramon, CA 94583

Re: Additional Investigations at Unocal #0746, 3943 Broadway, Oakland 94611

Dear Mr. Ralston:

The recent water recovery tests and vapor extraction pilot test performed suggest that standard groundwater exatraction or vapor extraction techniques are not suitable for the remediation of petroleum hydrocarbon contamination at the above referenced site. Your consultant, Kaprealian Engineering Inc, has recommended that long term monitoring continue, to verify that the contaminant plume does not continue to migrate. And that in time, the levels of contamination will naturally attenuate.

This may be a suitable management alternative for this site after a risk assessment has been performed and cleanup levels are determined. I would need verification that residual hydrocarbons in soil will not continue to be a source of contamination to ground water. The former underground storage tank pit appears to have been adequately overexcavated. Still, there are elevated levels of (free product, that is) TPH-G and benzene in groundwater from wells MW-3 and MW-5. A soil investigation may be required between the former pump islands and monitoring well MW-3.

Also, the next quarterly sampling event should include the analysis for MTBE of groundwater from wells MW-9 and MW-12.

Our office has moved to: 1131 Harbor Bay Parkway, 2nd Floor, Alameda, CA 94502. Our phone lines are not yet connected, but I may be reached at (510) 271-4330. Please do not hesitate to call if you have any questions or comments regarding this letter.

eva chu
Hazardous Materials Specialist

cc: Tim Ross, KEI, 2401 Stanwell, Dr, Suite 400, Concord, 94520
files (unocal01.5)

ALAMEDA COUNTY - ENVIRONMENTAL HEALTH - HAZARDOUS MATERIALS DIVISION

MEMORANDUM

DATE: April 19, 1994

TO: file

FROM: Brian P. Oliva

SUBJ: Complaint from Glovatorium on Broadway between 40th and 38th Streets, Oakland, CA 94611

In response to a complaint this office received at 2:30 pm on April 19, 1994, this office conducted a "complaint inspection" of the area in question at approximately 3:15 that same day. I went to the area of concern, where the City of Oakland Public Works, under the supervision of Kevin Brown, P.E., with the City of Oakland, was undertaking sewer line repair. The complaint indicated that there was gasoline present in the soil being removed from the ground during street work. Upon contact with Mr. Brown, he stated that samples had already been taken by Public Works for analysis. I told him that due to the nature of the complaint, that I would also be taking a sample of soil. He agreed to this and a sample was taken at an approximate depth of 8-10 feet below surface grade. A sample was taken under "chain of custody", to this office. The sampling followed a cursory sweep of the area with a "Microtip" (PID). The results of the PID were negative in all areas of the trench, in the bottom of the trench at 10 feet (the walls were shorn). and in the sewer line itself. Following the sweep, I instructed Mr. Brown to call us if he encountered any gasoline either in the soil, or in the sewer. The inspection was completed at approximately 4:00, and I returned to the office.

4/20/94. Spoke w/ T. Ross at RET. Still no QMRS since Aug 1993 sampling. He will send copies. Also water recovery test done - w/ poor results. Told him they must consider other possible clean up alternatives, including excavation. Meeting will be set shortly after I receive recent letter sent to this office

Brian P. Oliva

cc: Ariu
Eva Chew
Larry Blazer
Rob Weston

P.S.: While in the area I noted a BAAQMD vehicle accross the street. I spoke to the driver, Jorge Franco, who stated he was there on a complaint inspection of Glovatorium he had received from "smoke" coming from the building.

USOCAL
3943 Bdwy

0.8

KAPREALIAN ENGINEERING
INCORPORATED

ALCO
HAZMAT

94 APR 21 AM 10:37

April 20, 1994

Consider:
1) SBs between Pump Islands + MW-3 to verify no soil contam. contributing to GW contam.
2) Any leaks/spills from new tank system?
3) Analyze for MTBE in MWs 9 and 12 in future GMR.

Ms. Eva Chu
Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, CA 94621

RE: Results of Water Recovery Tests for
Unocal Service Station #0746
3943 Broadway
Oakland, California

Dear Ms. Chu:

Per our telephone conversation, the attached table presents the numerical results of the water recovery tests that were performed on existing monitoring wells MW3, MW4, MW5, and MW8 at the subject site. The purpose of a water recovery test is an initial screen to determine if an aquifer is capable of sustaining a continuous (but relatively low) extraction rate.

To briefly summarize the test procedure, the water level in the test well(s) is initially measured. A predetermined amount of water (usually 50 gallons) is then pumped from the well via a submersible pump. Subsequent to the pumping of the well, water levels are measured (by the use of a sounder) at fixed time intervals in order to determine the relative recharge rate in the wells.

As shown in the attached table, three of the four test wells dewatered after 10 or less gallons of water had been purged from them. In addition, the fourth well only recovered to 88% of the initial water level after 40 minutes had elapsed since the completion of purging. Based on these results, it does not appear that the aquifer in the areas of these four wells is capable of sustaining an extraction rate that would be suitable for remediation or hydraulic control purposes.

The most recent water recovery tests performed were the second set of such tests performed at the site. In addition, a vapor extraction pilot test was also conducted at the site. An aquifer test well was also installed in the vicinity of wells MW3 and MW5 at the site for the purpose of conducting a pump test. However, insufficient water was present in the well to conduct the test. Based on the results of these tests, it does not appear that standard ground water extraction or vapor extraction techniques are suitable for the site.

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

Therefore, based on our conversation, a conversation that I had with Mr. Ed Ralston of Unocal Corporation, the results of the remedial tests conducted to date, and the historical monitoring data (which indicates that a zero line of contamination has been established in the vicinity of the site and that the contamination does not appear to be migrating), we request that a meeting be scheduled in order to mutually agree upon the most appropriate next step in the environmental investigation at the site.

I look forward to hearing from you with a proposed meeting date. If you have any questions, please contact Mr. Ed Ralston of Unocal Corporation at (510) 277-2311 or myself at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

Timothy R. Ross

Timothy R. Ross
General Manager

TRR:jad\EC0420

Attachments

cc: Edward C. Ralston, Unocal Corporation

TABLE 1

SUMMARY OF WELL RECOVERY DATA

(Measured on February 24, 1994)

Well Number	Average Flow Rate (gpm)	Casing Volume (gallons)	Amount Purged (gallons)	Casing Volumes Purged	Recovery (%)	Recovery Time (Hours)
MW3	1.7	2.4	10*	4.2	69.4	0.08
					86.6	0.17
					93.5	0.25
MW4	2.0	1.9	6*	3.2	14.3	0.08
					19.9	0.17
					23.5	0.25
					26.1	0.33
					28.5	0.42
					30.3	0.50
					32.3	0.58
					34.3	0.67
					36.1	0.75
					38.3	0.83
					39.2	0.92
					40.6	1.00
MW5	2.9	2.0	50	25.0	51.0	0.08
					60.8	0.17
					71.8	0.25
					75.6	0.33
					80.2	0.42
					83.4	0.50
					86.6	0.58
					88.0	0.67
MW8	1.7	2.2	10*	4.5	52.6	0.08
					77.2	0.17
					89.5	0.25
					94.7	0.33

* Well dewatered after purging indicated amount.

KAPREALIAN ENGINEERING
INCORPORATED

ALCO
HAZMAT

94 MAY 12 PM 1:12

April 20, 1994

Ms. Eva Chu
Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, CA 94621

RE: Results of Water Recovery Tests for
Unocal Service Station #0746
3943 Broadway
Oakland, California

Dear Ms. Chu:

Per our telephone conversation, the attached table presents the numerical results of the water recovery tests that were performed on existing monitoring wells MW3, MW4, MW5, and MW8 at the subject site. The purpose of a water recovery test is an initial screen to determine if an aquifer is capable of sustaining a continuous (but relatively low) extraction rate.

To briefly summarize the test procedure, the water level in the test well(s) is initially measured. A predetermined amount of water (usually 50 gallons) is then pumped from the well via a submersible pump. Subsequent to the pumping of the well, water levels are measured (by the use of a sounder) at fixed time intervals in order to determine the relative recharge rate in the wells.

As shown in the attached table, three of the four test wells dewatered after 10 or less gallons of water had been purged from them. In addition, the fourth well only recovered to 88% of the initial water level after 40 minutes had elapsed since the completion of purging. Based on these results, it does not appear that the aquifer in the areas of these four wells is capable of sustaining an extraction rate that would be suitable for remediation or hydraulic control purposes.

The most recent water recovery tests performed were the second set of such tests performed at the site. In addition, a vapor extraction pilot test was also conducted at the site. An aquifer test well was also installed in the vicinity of wells MW3 and MW5 at the site for the purpose of conducting a pump test. However, insufficient water was present in the well to conduct the test. Based on the results of these tests, it does not appear that standard ground water extraction or vapor extraction techniques are suitable for the site.

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

Therefore, based on our conversation, a conversation that I had with Mr. Ed Ralston of Unocal Corporation, the results of the remedial tests conducted to date, and the historical monitoring data (which indicates that a zero line of contamination has been established in the vicinity of the site and that the contamination does not appear to be migrating), we request that a meeting be scheduled in order to mutually agree upon the most appropriate next step in the environmental investigation at the site.

I look forward to hearing from you with a proposed meeting date. If you have any questions, please contact Mr. Ed Ralston of Unocal Corporation at (510) 277-2311 or myself at (510) 602-5100.

602-5101

Sincerely,

Kaprealian Engineering, Inc.

Timothy R. Ross

Timothy R. Ross
General Manager

TRR:jad\EC0420

Attachments

cc: Edward C. Ralston, Unocal Corporation

TABLE 1

SUMMARY OF WELL RECOVERY DATA

(Measured on February 24, 1994)

Well Number	Average Flow Rate (gpm)	Casing Volume (gallons)	Amount Purged (gallons)	Casing Volumes Purged	Recovery (%)	Recovery Time (Hours)
MW3	1.7	2.4	10*	4.2	69.4	0.08
					86.6	0.17
					93.5	0.25
MW4	2.0	1.9	6*	3.2	14.3	0.08
					19.9	0.17
					23.5	0.25
					26.1	0.33
					28.5	0.42
					30.3	0.50
					32.3	0.58
					34.3	0.67
					36.1	0.75
					38.3	0.83
					39.2	0.92
					40.6	1.00
MW5	2.9	2.0	50	25.0	51.0	0.08
					60.8	0.17
					71.8	0.25
					75.6	0.33
					80.2	0.42
					83.4	0.50
					86.6	0.58
					88.0	0.67
MW8	1.7	2.2	10*	4.5	52.6	0.08
					77.2	0.17
					89.5	0.25
					94.7	0.33

* Well dewatered after purging indicated amount.

KAPREALIAN ENGINEERING
INCORPORATED

June 16, 1994

Ms. Eva Chu
Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, CA 94621

RE: Proposed Next Phase of Work at the
Unocal Service Station #0746
3943 Broadway
Oakland, California

Dear Ms. Chu:

Pursuant to our previous conversations, this letter has been prepared in order to outline the next proposed phase of work for the subject site. As outlined in my letter dated April 20, 1994, the geological formation and aquifer characteristics of the site are such that standard ground water extraction or vapor extraction techniques do not appear to be suitable for this site.

In reviewing alternatives for the next phase of work to be conducted at the site, three important points have been considered. These points are as follows:

1. A consistent ground water flow direction has been established at the site and vicinity. Based on the ground water monitoring data that has been collected and evaluated since the initial installation of monitoring wells at the site in November of 1989, a consistent southwesterly flow direction has been established.

2. The extent of the downgradient ground water contamination has also been established. The most downgradient wells at the site vicinity (MW10 and MW11) have shown no detectable concentrations of TPH as gasoline or benzene since the installation of these wells in February of 1992 (nine quarters of sampling). In addition, downgradient well MW12 has shown no detectable concentrations of TPH as gasoline or benzene since the installation of this well in August of 1992 (seven quarters of sampling).

3. Free product has historically been periodically detected in on-site monitoring wells MW3 and MW5. However, Kaprealian Engineering, Inc's. (KEI) program of purging these wells on a frequent basis, along with the installation of skimming devices in these wells, have prevented the free product from migrating to further downgradient wells, and has also resulted in the reduction of the volume of free product present in these wells to trace amounts.

how much has been recovered to date

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

Based on the three preceding factors, the relatively impermeable nature of the formation, and the relatively slow recharge of the aquifer at the site, it is Unocal's and KEI's opinion that this site will most likely meet the criteria developed by the Regional Water Quality Control Board (RWQCB) for a non-attainment zone (NAZ). The NAZ criteria has been proposed by the RWQCB for sites in which the extent of contamination and direction of ground water flow have been defined, in which remediation of the existing contamination did not appear to be technically or cost-effectively feasible, and in which no beneficial use receptor area is present.

The NAZ criteria is a proposed amendment to the Water Quality Control Plan, San Francisco Bay Region. A copy of the applicable portion of the proposed Basin Plan Amendment is attached for your review and information.

Pacific Environmental Group of San Jose, California, is presently putting together a list of Unocal sites that appear to meet the proposed NAZ criteria. A presentation will subsequently be made to the RWQCB in order to attempt to have these sites be classified as non-attainment zones.

Therefore, it is Unocal's intention to include this site in the list of sites that will be submitted to the RWQCB for non-attainment status once (and if) the NAZ criteria has been finalized and adopted. Please be aware that as a condition of being classified as a non-attainment zone, Unocal will most likely be required to perform long-term ground water monitoring at the site. In addition, in order to further reduce or eliminate the trace amounts of free product present in wells MW3 and MW5, Unocal plans to continue the purging of these wells.

I trust that this letter adequately outlines our rationale for the next proposed phase of work for the site. If you have any questions, please feel free to contact me at (510) 602-5101.

Sincerely,

Kaprealian Engineering, Inc.

Timothy R. Ross
General Manager

TRR:jad\EC0616

Attachment

cc: Mr. Edward C. Ralston, Unocal Corporation

ALCO HAZMAT

KAPREALIAN ENGINEERING INCORPORATED

93 DEC 22 PM 2:04

JA 12/27

December 20, 1993

Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, California 94621

Attention: Ms. Eva Chu

RE: Unocal Service Station #0746
3943 Broadway
Oakland, California

Dear Ms. Chu:

This letter is intended to confirm our telephone conversation earlier today, and to notify you with regard to the schedule for conducting water recovery tests in relation to the above referenced site.

In our letter to the Alameda County Health Care Services (ACHCS) Agency dated October 26, 1993, Kaprealian Engineering, Inc. (KEI) recommended that water recovery tests be conducted on existing wells MW3, MW4, MW5, and MW8 in order to determine whether or not the results of pumping from extraction well RW1 are truly representative of the southeastern portion of the site. The ACHCS approved this course of action in a letter to KEI dated November 16, 1993.

The water recovery tests have been scheduled to be conducted on February 16, 1994. Unfortunately, as we discussed today, these tests could not be scheduled any sooner due to difficulties encountered with obtaining access to the off-site property where well MW8 is located.

Should you have any questions regarding this matter, please do not hesitate to contact me at (510) 602-5106.

Sincerely,

Kaprealian Engineering, Inc.

Aram Kaloustian

Aram B. Kaloustian
Project Engineer

ABK:jad\EC1220

cc: Mr. Edward C. Ralston, Unocal Corporation

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

StID 1119

November 16, 1993

Aram Kaloustian
KEI Engineering
2401 Stanwell Dr., Suite 400
Concord, CA 94520

Subject: Work Proposal Approval for Unocal #0746, 3943 Broadway, Oakland 94611

Dear Mr. Kaloustian:

I have completed review of KEI's October 26, 1993 letter proposing to perform a groundwater recovery test from monitoring wells MW3, MW4, MW5 and MW8 at the above referenced site. This proposal is acceptable and field activities should commence **within 45 days** of the date of this letter. Please notify this office at least 48 hours prior to the start of field activites.

If you have any questions, I can be reached at (510) 271-4530.

Sincerely,

eva chu
Hazardous Materials Specialist

cc: Ed Ralston, UNOCAL, P.O.Box 5155, San Ramon, Ca 94583
files

12/10/93 MPDS Services are doing GW Monitoring at site. Aram is making arrangement for them to bring out pumps to do test. Hope to schedule for January. Aram will send me letter w/ new projected schedule.

unocalo1.4

KAPREALIAN ENGINEERING
INCORPORATED

STID 1119

93 OCT 27 PM 3:39

October 26, 1993

Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, California 94621

Attention: Ms. Eva Chu

RE: Unocal Service Station #0746
3943 Broadway
Oakland, California

Dear Ms. Chu:

As you requested during our telephone conversation of October 20, 1993, this letter summarizes the various attempts to implement remedial action at the above referenced site since June of 1992.

In our work plan/proposal (KEI-P89-0805.P7) dated March 9, 1992, Kaprealian Engineering, Inc. (KEI) proposed the installation of an initial ground water extraction well (RW1) for the purpose of aquifer testing and subsequent ground water remediation. On June 25, 1992, extraction well RW1 was drilled and installed to a total depth of 17.5 feet below grade. However, ground water was not encountered during drilling.

On July 3, 1992, KEI arranged for a technician to develop well RW1 and prepare it for ground water extraction purposes including aquifer testing. Unfortunately, the well continually dewatered during well development procedures. In order to verify the results of the first attempt to develop well RW1, KEI again returned to the site on October 27, 1992, in an attempt to redevelop the well. Unfortunately, the well dewatered as before. The well development data are summarized on the attached table. Based on this information, KEI concluded that ground water extraction including aquifer testing was not feasible using well RW1.

In our work plan/proposal (KEI-P89-0805.P7R) dated February 15, 1993, KEI proposed conducting a pilot vapor extraction test using well RW1 in an attempt to determine the feasibility of using RW1 as a vapor extraction well. The pilot test was conducted on April 12 through 14, 1993. Unfortunately, due to the relatively high water table and the impermeable soil conditions at the site, the pilot vapor extraction test system was unable to operate continuously for more than seven hours. Based on these results, and based on the insignificant hydrocarbon extraction rates when the system was operational, KEI concluded that vapor extraction was not a feasible means of remediation using well RW1. Details of the pilot vapor extraction test activities and the analytical results of the air

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

bag samples collected during the test are summarized in KEI's report (KEI-P89-0805.R10) dated May 18, 1993.

Based on the results of these attempts to implement remedial action at the subject site, KEI proposes an alternative method for remediation, which involves monitoring wells MW3, MW4, MW5 and MW8. KEI proposes that ground water from all four wells be extracted for an extended period of time to determine pumping and recovery rates for these wells. This information can be used to determine whether or not the results of pumping from RW1 is truly representative of the southeastern portion of the site. Additional recommendations for contaminant migration control and remediation can be made after this new data is obtained from the monitoring wells.

Based on the numerous attempts to implement remediation at this site, it is clear that both Unocal and KEI have been and continue to be dedicated to the site assessment and remediation of this site. Unfortunately, our efforts to date have not produced a feasible course of action for remediation. I appreciate all of your help during the course of this project and am hopeful that an acceptable course of action can be determined in the near future.

Should you have any questions regarding this matter, please do not hesitate to contact me at (510) 602-5106.

Sincerely,

Kaprealian Engineering, Inc.

Aram B. Kaloustian
Project Manager

ABK:jad\EC1026

Attachment

cc: Mr. Edward C. Ralston, Unocal Corporation

WELL DEVELOPMENT DATA

WELL ID.:	RW1
DATE:	7/3/92
DEPTH TO WATER (before purging):	9.50 feet
WELL DEPTH:	16.68 feet
PRODUCT THICKNESS:	none
PURGED WATER:	105 gallons
PURGED PRODUCT:	none

Field Technician's Notes:

RW1 - Surged well before purging. Well dewatered after 25 gallons purged. Allowed for full recovery before surging and purging the well again. Well dewatered several times during development. Water cleared to 336 NTU after 105 gallons purged.

WELL ID.:	RW1
DATE:	10/27/92
DEPTH TO WATER (before purging):	10.37 feet
WELL DEPTH:	16.62 feet
PRODUCT THICKNESS:	none
PURGED WATER:	20 gallons
PURGED PRODUCT:	none

Field Technician's Notes:

RW1 - Surged well for 45 minutes prior to purging. Well dewatered after 12 gallons purged. Water cleared to 35 NTU after 20 gallons pumped. Recovery poor.

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

StID 1119

October 20, 1993

Aram Kaloustian
KEI Engineering
2401 Stanwell Dr., Suite 400
Concord, CA 94520

Subject: Groundwater Remediation for Unocal Station #0746, 3943 Broadway, Oakland 94611

Dear Mr. Kaloustian:

I have completed review of KEI's May 1993 Pilot Vapor Extraction Test Report and September 1993 Quarterly Report for the above referenced site. Data collected from the vapor extraction test in April 1993 indicated an insignificant hydrocarbon extraction rate and KEI concluded that vapor extraction was not a feasible technology for remediation of soil contamination at the site. This test was complicated with the high groundwater levels.

The soil boring log for the vapor extraction well RW-1 show this well to be screened from 5-15 feet below grade. Groundwater has been consistently at 8-10' depth. Without drawing groundwater down, vapor extraction may not be as effective. Taking this into consideration, would a pilot test consisting of groundwater extraction, drawing water down 5-6 feet, in conjunction with vapor extraction be more effective for soil and groundwater remediation?

If not, other feasible cleanup technologies should be considered. Please submit a workplan proposal for alternative soil and water remediation technology planned for this site. This report is due **within 45 days of the date of this letter.** If you have any questions or comments, please call me at (510) 271-4530.

eva chu
Hazardous Materials Specialist

cc: Ed Ralston, UNOCAL, P.O.Box 5155, San Ramon, CA 94583
files

Include approval of decreasing frequency of sampling

unocal01.3

KAPREALIAN ENGINEERING
INCORPORATED

July 1, 1993

Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, California 94621

Attention: Ms. Eva Chu

RE: Unocal Service Station #0746
3943 Broadway
Oakland, California

Dear Ms. Chu:

As discussed during our telephone conversation earlier today, Kaprealian Engineering, Inc. (KEI) will investigate the feasibility of enhancing the natural biodegradation process of the contaminants detected at the above referenced site. As you know and confirmed, results of the previously attempted aquifer pumping test and recently conducted vapor extraction test did not prove to be feasible for this site. Therefore, alternative remedial methods, such as natural biodegradation, will be further researched.

On behalf of Unocal and KEI, I appreciate your assistance with this project. Should you have any additional questions regarding this site, please do not hesitate to contact me at (510) 602-5106.

Sincerely,

Kaprealian Engineering, Inc.

Aram B. Kaloustian
Project Engineer

ABK:jad\EC0701

cc: Mr. Ed Ralston, Unocal Corporation

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

StID 1119

April 23, 1993

Mr. Edward Ralston
UNOCAL
P.O.Box 5155
San Ramon, CA 94583

Subject: Groundwater Sampling at UNOCAL Service Station #0746, 3943 Broadway, Oakland, CA 94611

Dear Mr. Ralston:

I have reviewed Kaprealian Engineering's Quarterly Report, dated March 30, 1993, for the above referenced site. Contaminant levels appear to be consistently elevated for monitoring wells MW-3, MW-4, and MW-5. Recent levels of contaminants in MW-1 may be due to the increase in groundwater elevation, dissolving petroleum products from soil at 7 to 8 feet depths.

Monitoring well MW-2 has detected contaminants in the methyl-tri-butyl ether (MTBE) range for the last two quarters. Future groundwater samples collected from MW-2 should also be analyzed for MTBE. Monitoring wells MW-8 and MW-9 have been inacessible for sampling for the last two quarters. Efforts must be made to gain access to these wells for sampling/monitoring in the future.

Also, maintain a record of the amount of free product removed from the monitorings wells. If you have any questions, please contact me at (510) 271-4530.

Sincerely,

eva chu
Hazardous Materials Specialist

cc: Aram Kaloustian, KEI, 2401 Stanwell Dr., Suite 400, Concord, CA 94520
Rich Hiett, RWQCB
files

unocalo.2

KAPREALIAN ENGINEERING
INCORPORATED

Rec
3/22/93

March 19, 1993

Mr. Dave Hoover
Unocal Corporation
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, California 94583

RE: Notification of Vapor Extraction Test
Unocal Service Station #0746
3943 Broadway
Oakland, California

Dear Mr. Hoover:

This letter is intended to inform you that a vapor extraction test will be conducted at the subject site, as proposed in Kaprealian Engineering, Inc's. (KEI) revised work plan/proposal (KEI-P89-0805.P7R) dated February 15, 1993. The test is currently scheduled to begin on Monday, April 12, 1993, and continue until Friday, April 16, 1993.

Please notify the station dealer and all other appropriate Unocal associates of the above test dates. The service station dealer should be informed that the test equipment, including an internal combustion engine (ICE) and a 500-gallon propane tank, will be delivered to the site on April 12, 1993, and remain on-site for approximately one week. The location of the equipment to be used during the test is shown on the attached Site Plan.

Barricades will be placed around equipment and on top of monitoring wells MW3, MW4, MW5, MW7, and MW9 where magnehelic gauges will be used to monitor the pressure changes in the observation wells, as shown on the attached Site Plan. The service station dealer should also be aware that we will work with him to minimize any inconvenience.

Finally, KEI will also notify the dealer of the above dates at least 48 hours prior to our arrival.

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

Should you require any further information about the scheduled work, please do not hesitate to call me at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

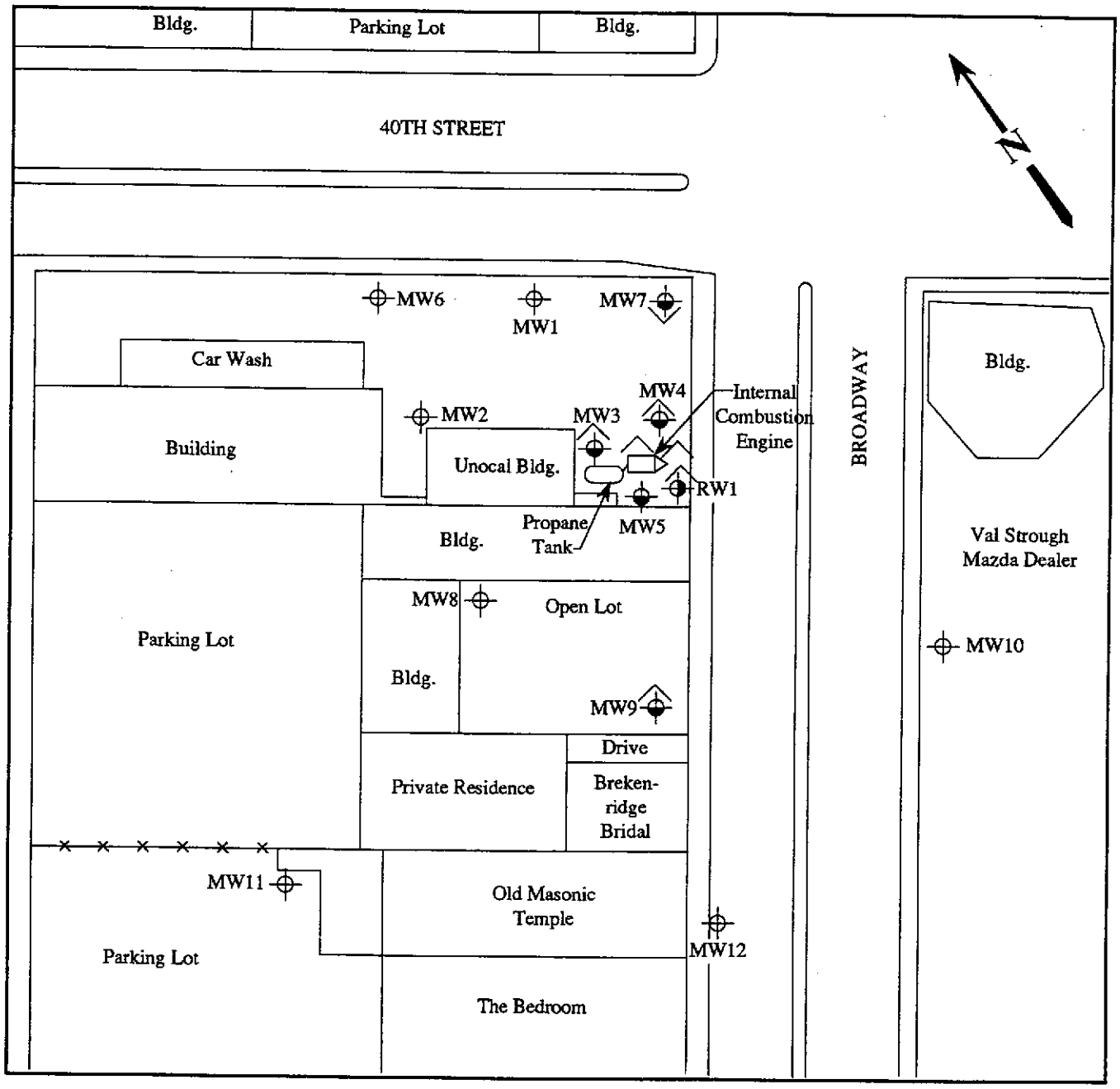
Sarkis Soghomonian

Sarkis Soghomonian
Staff Engineer

SS:jad\DH0319A

Attachment: Site Plan

cc: Eva Chu, Alameda County Health Care Services Agency ✓
Ed Ralston, Unocal Corporation



LEGEND

- Monitoring well
- 6-inch diameter well to be used for vapor extraction pilot test
- Monitoring well to be used as observation well during vapor extraction test
- Barricade

0 60 120

Approx. scale feet

SITE PLAN

KAPREALIAN ENGINEERING INCORPORATED

UNOCAL SERVICE STATION #0746
3943 BROADWAY
OAKLAND, CA

FIGURE
1

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

StID 1119

March 12, 1993

Mr. Ed Ralston
UNOCAL
P.O.Box 5155
San Ramon, CA 94583

Subject: Work Plan Approval for UNOCAL Station #0746 at 3943 Broadway, Oakland 94611

Dear Mr. Ralston:

This office has completed review of KEI's Revised Work Plan/Proposal, dated February 15, 1993, for the above referenced site. The proposed pilot vapor extraction test to assess the feasibility of vapor extraction at this site is acceptable. Field work should commence within 45 days of the date of this letter. Please notify this office 48 hours prior to the start of field activities.

If you have any questions or comments, please contact me at (510) 271-4530.

Sincerely,

eva chu
Hazardous Materials Specialist

cc: Rich Hiett, RWQCB
Aram Kaloustian, KEI, 2401 Stanwell Dr., Suite 400, Concord CA 94520
Edgar Howell/files

unocalo1

Unocal Corporation
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, California 94583
Telephone (510) 867-0760
Facsimile (510) 277-2309

5570 #19

UNOCAL 76

January 04, 1993

Mr. Thomas F. Peacock
Alameda County Health Care
Services Agency
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

Northern Region
Corporate Environmental
Remediation & Technology

Environmental Investigation
UNOCAL SERVICE STATION #0746
3943 Broadway
Oakland, California

Dear Mr. Peacock:

This letter is written in response to your correspondence dated November 30, 1992, regarding the above-mentioned site.

As requested, I have enclosed a copy of page 7, which was inadvertently missing from the September 25, 1992 quarterly report.

With regard to your request for a remediation plan, Unocal requests that a meeting be conducted between the Alameda County Health Care Services Agency, Unocal and our consultant, Kaprealian Engineering, Inc., in order to discuss the difficulties that have been encountered in implementing remediation at this site. I will contact you in the upcoming week so that we can arrange a convenient meeting date and time.

Unocal appreciates all of your cooperation and is hopeful that a reasonable remediation plan can be implemented in the near future.

Should you have any questions or concerns regarding this matter, please feel free to contact me at (510) 277-2311.

Sincerely,

Edward C. Ralston

Edward C. Ralston
Environmental Geologist

cc: R.E. Bock
A.B. Kaloustian, KEI

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

November 30, 1992
STID# 1119

Unocal Corp.
ATTN: Ron Bock
P.O. Box 5155
San Ramon, CA 94583

Re: 3943 Broadway, Oakland, CA 94611

Dear Ron Bock:

This office has received and reviewed a letter dated September 22, 1992 and a Quarterly Report dated September 25, 1992 by Kaprealian Engineering. The recommendations on page 10 are acceptable with the following comment:

> Page 7 of the report was blank. Please submit a copy of this page.

This office would like to see a remediation plan submitted within 45 days of this letter. The plan should also deal with mass product removal rather than just controlling the plume.

If you have any questions concerning this matter please contact this office.

Sincerely,

Thomas F. Peacock, Supervising HMS
Hazardous Material Division

cc: Lester Feldman,RWQCB
Edgar Howell, Chief - Files
Clement Leung, 3943 Broadway, Oakland, CA 94611

Unocal Refining & Marketing Division
Unocal Corporation
2000 Crow Canyon Place, Suite 400
San Ramon, California 94583
Telephone (415) 867-0760

UNOCAL 76

STID 1179

Northern Division

September 22, 1992

Mr. Thomas Peacock
Alameda County Health Care
Services Agency
80 Swan Way, Room 200
Oakland, California 94621

RE: Unocal Service Station #0746
3943 Broadway
Oakland, California 94611

Dear Mr. Peacock:

This letter is written in response to your correspondence dated September 8, 1992, regarding the subject site.

In our consultant's, Kaprealian Engineering, Inc. (KEI), work plan/proposal (KEI-P89-0805.P7) dated March 9, 1992, KEI proposed the installation of one six-inch diameter recovery well for the purpose of ground water remediation. A pump test of the proposed well was also included in KEI's proposal. Data collected from the pump test is necessary to achieve hydraulic control of the contaminated ground water plume, and for the design of a ground water remediation system for the site.

On June 25 and 26, 1992, the proposed recovery well, RW1, and the previously proposed downgradient well, MW12, were installed at the subject site and in the site vicinity. KEI's well installation report for the aforementioned wells will be submitted in the near future. The recovery well was developed on July 3, 1992. The well de-watered several times during development and recovered poorly. Due to the relatively poor productivity of the recovery well, KEI is currently reviewing the available aquifer data and possible alternative remediation methods. In the interim, KEI has installed a surface skimming free product recovery system in well MW5.

Should you have any questions, comments, or concerns, please do not hesitate to call me at (510) 602-5100.

Sincerely,

Keith Bullock,
Environmental Engineer
Unocal Corporation

KEB\RHK\cmm

cc: Robert H. Kezerian, Kaprealian Engineering, Inc.

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

September 8, 1992
STID# 1119

Unocal Corp.
ATTN: Ron Bock
P.O. Box 5155
San Ramon, CA 94583

Re: 3943 Broadway, Oakland, CA 94611

Dear Ron Bock:

This office has received and reviewed several Quarterly Reports on the above site ending with March 9, 1992 report by Kaprealian Engineering. The recommendation on page 9 is acceptable with the following comments:

1. The installation of a 6" groundwater recovery well is acceptable but, given that MW5 has not been sampled for the last 3 events due to the presence of free product, shouldn't an extraction system be started immediately?

2. The investigation phase has pretty well defined the plume for TPHg and benzene and both plumes are similar. There is only one area which is downgradient and not well defined. Shouldn't the remediation phase begin soon?

3. This office would like to see a remediation plan submitted within 45 days of this letter. The plan should also deal with mass product removal rather than just controlling the plume.

If you have any questions concerning this matter please contact this office.

Sincerely,

Thomas F. Peacock, Supervising HMS
Hazardous Material Division

cc: Lester Feldman,RWQCB
Edgar Howell, Chief - Files
Clement Leung, 3943 Broadway, Oakland, CA 94611

Prop: Unocal Corp.
PO B ~~7000~~ 5155
~~LA 90054~~
San Ramon 583
Attn: Ron Bock
BS: Bway Union # 0746
Attn: Clement K. Leung
3943 Bway
Oak 611

DATE: 3-4-92

TO : Local Oversight Program

FROM: Brit Tomson

SUBJ: Transfer of Elligible Oversight Case

8006619

Site name: UNOCAL 8-16-89

Address: 3943 BROADWAY City OAK Zip 94611

Closure plan attached? (Y) N DepRef remaining $ ~~242.11~~ 3,41

DepRef Project # 104 STID #(if any) ~~4704~~ ~~4704~~ 1119

Number of Tanks: 3 removed? (Y) N Date of removal 8-16-89

Leak Report filed? (Y) N Date of Discovery 8-16-89

Samples received? Y N Contamination: SOIL + GW

Petroleum (Y) N Types: Avgas Jet fuel leaded (x2 unleaded) Diesel
fuel oil (waste oil) kerosene solvents

Monitoring wells on site 9 Monitoring schedule? (Y) N

Briefly describe the following:

Preliminary Assessment SHEEN ON GW

Remedial Action WEEKLY PURGING OF MWs 3,4,5 + 8

Post Remedial Action Monitoring

Enforcement Action

Comments: WATER IN GASOLINE TANK EXCAVATION AT UST REMOVAL (8-89)
NEW GASOLINE USTs INSTALLED
7/11/91 QTR REPORT PROPOSES TO INSTALL 3 MW OFF-SITE - THIS WORK WAS APPROVED BY GIL WISTAR ON 5/3/91 AND APPEARS TO BE STILL PENDING. ~~GIL~~ GIL W. ALSO REQUESTED A REMEDIATION PLAN
NO RESULTS IN FILE SINCE 7/11/91

Unocal Refining & Marketing Division
Unocal Corporation
2000 Crow Canyon Place, Suite 400
San Ramon, California 94583
Telephone (415) 867-0760

UNOCAL 76

May 16, 1991

Mr. Gil Wistar
Alameda County Health Care
Services Agency
80 Swan Way, Room 200
Oakland, California 94621

UNOCAL SERVICE STATION NO. 0746
3943 Broadway
Oakland, California

Dear Mr. Wistar:

I am in receipt of your May 3, 1991 letter regarding the above mentioned service station. I appreciate your concurrence with the proposed locations of the additional three monitoring wells, and Unocal is working on obtaining site access to install these wells. The wells will be installed as soon as possible after site access is received.

With respect to the specific comments given in your letter, Unocal offers the following response:

1) It is sound engineering practice to first identify the extent of any contaminant plume before designing a final remediation system. This is necessary because the most important design parameters for any recovery/treatment system are the volume of air/water to be treated and the contaminant loading. Without knowledge of these parameters, any remediation design could be seriously underdesigned or overdesigned. In addition, service stations are generally located in commercial areas containing a number of underground tanks, bringing up the possibility of comingling contaminant plumes. It is therefore prudent that the extent of contamination be defined before a full-scale remediation plan is prepared, primarily to allow for the system to be adequately designed and secondarily to eliminate any possibility of drawing other plumes onto our property.

2) In accordance with RWQCB policy, Unocal has implemented interim removal of free product and groundwater with high dissolved concentrations of contaminants to reduce the likelihood of further migration until the plume can be fully delineated and active final remediation can begin. In addition, it is important to note that Unocal has remediated the majority of the original source of contamination by excavating the majority of the contaminated soil during the tank replacement.

3) It is Unocal policy to store contaminated purge water on-site until analytical results of groundwater samples are received. At that point, we contract directly with a disposal firm (e.g. H&H, Gibson Oil, or Armour Petroleum) to properly dispose of the water. The consultant coordinates with the disposal firm, but does not subcontract the work, which is why it is not included in the technical report. At this site, the purge water has been transported by Armour Petroleum to Solano Community College, where it is recycled for use at a Fire Training School. I have attached copies of disposal receipts as requested.

With respect to your specific comments concerning the content of Kaprealian Engineering reports, I have attached a response prepared by KEI which addresses each of the comments in the order they were presented in your letter.

In summary, interim remedial action, including removal of the old underground storage tanks and excavation of the majority of the contaminated soil, has been completed. In addition, purging of contaminated water from monitoring wells is continuing in an effort to limit any further migration of the contaminant plume in the groundwater.

It is our intention to initiate a final remedial action at this site, but to do so in a logical, phased approach. The first phase is to complete delineation of the contaminant plume. The next step will be to perform appropriate tests to collect data on site specific aquifer characteristics. Once that data is known, then locations for extraction wells can be determined, water disposal options studied, and the appropriate treatment system selected and sized. Information requested in your February 1, 1991 concerning preparation of a system maintenance plan and system evaluation/monitoring protocol can only be prepared after the system has been selected.

I would be happy to meet with you at your convenience to discuss this site and our course of action. If you have any immediate questions, please feel free to call me @ (415) 277-2303.

Sincerely,

Ronald E Bock

Ronald E. Bock
Environmental Engineer

attachment

cc: T. R. Ross - Kaprealian Engineering, Inc.

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581

May 15, 1991

Unocal Corporation
2000 Crow Canyon Place, #400
P.O. Box 5155
San Ramon, California 94583

Attention: Mr. Ron Bock

RE: Response to a Letter Written by
Mr. Gilbert Wistar of the
Alameda County Health Care Services Agency
pertaining to
Unocal Service Station #0746
3943 Broadway
Oakland, California

Dear Mr. Bock:

In response to the letter dated May 3, 1991 written by Mr. Wistar, particularly to the three items of concern addressed in the subject letter, Kaprealian Engineering, Inc. (KEI) offers the following comments:

1. The historical background information is included in all reports in order to allow the reader a concise view of all of the work previously done at a site. The information is also provided so that the reader will not have to face the cumbersome task of referring to previous reports if a question arises pertaining to past work done at a site. In addition, the purpose of any engineering/technical report is to explain as clearly as possible the problems encountered at a specific site and what the course of action is to resolve these problems. A report should be a stand-alone document that pulls together past and present information in order to give a comprehensive overview of the technical direction of the work done, and the work to be done, at the site. Therefore, for the preceding reasons, KEI strongly recommends the continuation of the practice of providing historical background information in all technical reports. However, for Mr. Wistar's information, one of the features of KEI's reports is that the background information section is completely independent from the body of the report. The reader of the report can skip over this section and still be able to completely understand the main body of the report.

2. All quarterly ground water sampling data in all KEI reports is reported by sampling date instead of by individual monitoring wells. The main reason that the data is organized in this format is because the amount of ground water contamination present in a well at any one time is a function of several factors - ground water level, the level of soil contamination in contact with the ground water adjacent to the monitoring well, ground water quality in the vicinity of the well (as shown in previous monitoring data of adjacent wells), ground water gradient, remediation work performed at the site, and potential natural biodegradation of the contamination in the water. Due to the preceding complexities involved with analyzing ground water sampling data, KEI believes that ground water must be considered and reviewed as a single entity over the entire area investigated (i.e. all monitoring wells), instead of just at individual sampling points (i.e. an individual monitoring well). Therefore, KEI believes that a reporting format showing data from all wells at a single sampling time, instead of a format showing data from each well at various sampling times, provides a more comprehensive view of overall ground water quality at the site.

3. Site Vicinity Maps are included in KEI reports when additional work off of the original study site is deemed necessary. The map is included to show the approximate location of any off-site work proposed or performed. Civil engineering surveys are not performed to show the exact locations of buildings, canopies, monitoring wells, etc. because of the costs associated with the surveys and because an <u>exact</u> location of each of the preceding items is not necessary to effectively evaluate the data generated for the site (in most instances). However, every effort is made to ensure that the site maps show the <u>approximate</u> locations of all pertinent objects by using the most accurate available information (existing site plans constructed from previous surveys, site measurements from KEI's field engineers and geologists, county maps, etc.). It should be noted that while <u>locations</u> of objects at a site are not professionally surveyed, <u>elevations</u> of monitoring wells are always professionally surveyed.

Should you have any questions regarding this letter, please do not hesitate to call me at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Timothy R. Ross

Timothy R. Ross
Project Manager

TRR:jad\0746

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
Hazardous Materials Program
80 Swan Way, Rm. 200
Oakland, CA 94621
(415)

May 3, 1991

Mr. Ron Bock
Unocal Corp.
P.O. Box 5155
San Ramon, CA 94583

RE: **Quarterly report and work plan from Kaprealian Engineers, Inc. for Unocal # 746, 3943 Broadway, Oakland**

Dear Mr. Bock:

This office has reviewed the above documents, and we concur with the proposed locations for the three additional monitoring wells. These wells should be installed, developed, and sampled as soon as possible. Whether or not these wells permit downgradient definition of the groundwater plume, Unocal's next step must be the preparation of a remediation plan, as discussed in our February 1 letter.

An apparent oversight in the quarterly technical report is a lack of discussion about the disposition of purged groundwater. Obviously, each of the wells has been purged prior to sampling each quarter; in addition, KEI indicates that it has been (or will be) pumping contaminated water out of monitoring wells MW-3, 4, 5, and 8, at the rate of 55 gallons per week. This all adds up to a lot of contaminated groundwater. Is Unocal letting it accumulate on-site, or has this water been disposed of?

Finally, the format of the KEI reports for this site makes it difficult to analyze and compare data, for the following reasons:

1. The same unnecessary text is repeated in each successive technical report and work plan, describing data back to the tank removal. Please omit this "background boilerplate" text from future reports.

2. Tables of historical data from monitoring wells are useful, but they should be organized by <u>well</u>, rather than by <u>sampling date</u> (e.g., Table 1 in KEI's April 12 report). This will permit a much more efficient analysis of contaminant trends in each monitoring well.

3. Report graphics are too small and not always to scale. For example, Figure 1A of the April 12 quarterly report does not show the actual location of monitoring well MW-9, and the site vicinity map seems too cramped for the amount of data it contains.

Please inform me of the disposition of all purged well water from the site. If any of this contaminated water has been disposed of, please provide receipts that document the disposal.

If you have any questions about this letter, please contact me at 271-4320.

Sincerely,

Gilbert M. Wistar

Gil Wistar
Hazardous Materials Specialist

cc: Mardo Kaprealian, Kaprealian Engineers (P.O. Box 996, Benicia, CA 94510)
Lester Feldman, San Francisco Bay RWQCB
Rafat Shahid, Asst. Agency Director, Environmental Health
files

13854

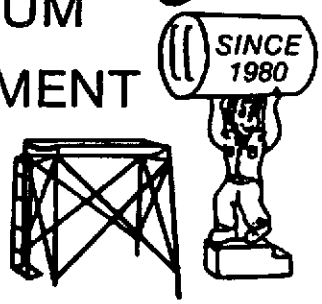
FAIRFIELD, CA
(707) 437-6888

SACRAMENTO, CA
(916) 441-2886

FAX NUMBER
(707) 437-4357

GENERAL CONTRACTOR
NUMBER 498721

ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION



COPY

INVOICE

17247

Please Pay from this invoice

REMIT TO:
P.O. BOX 507
VACAVILLE, CA 95696-0507

SOLD TO Unocal Corp.
ADDRESS 2000 Crow Canyon Place #400
CITY San Ramon, Ca. 94583
Attn: Rick Sisk

SHIP TO Unocal 0746
ADDRESS 3943 Broadway
CITY Oakland, Ca.

CUSTOMER ORDER NO.	ACCOUNT NUMBER	TERMS	SALESMAN	INVOICE DATE
B2010B	EEB001	Net 30		4-12-91

ORDERED	B/O	SHIPPED	DESCRIPTION	UNIT PRICE	AMOUNT
			See attached MRO associated with the removal of 550-gallon sewage water tank on site barrels at U-0746 as requested per KEI		
			130-25-0746-920-367-51-1490262		
			082489		

APPROVED
APR 25 1991
C. M. DOMINGUEZ

APPROVED
APR 1[illegible] 1991
RICK SISK

TITLE TO THE FOREGOING GOODS SHALL NOT PASS TO CUSTOMER UNTIL TOTAL AMOUNTS SHOWN ON INVOICE HAVE BEEN PAID IN FULL TO ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION. IN THE EVENT OF EFFORTS OR LEGAL PROCEEDINGS TO ENFORCE THE COLLECTION OF SUCH SUMS DUE HEREIN, CUSTOMER AGREES TO PAY REASONABLE ATTORNEY'S FEES.

A **finance charge** of **1½%** per month, which is an **annual percentage rate** of **18%**, is charged on all past due accounts.

SIGNATURE

DATE DELIVERED

SUBTOTAL	
TAX	
7.75	1 15
USE	550 00
FREIGHT	
LABOR	146 00
TOTAL $	697 15

Thank You

Maintenance / Repair Order

Unocal Refining & Marketing Division

UNOCAL 76

BLANKET CONTRACT NO. B2010B

CONTRACTOR'S NAME: Armour Petroleum Service

SERVICE STATION ADDRESS: 3943 Broadway Oakland Ca.

FIELD NO.

STATION NO. 0746

ITEMS WORKED ON (SHOW MFG. NAMES & SERIAL NOS.)

WORK DESCRIPTION (IF PUMP TOTALIZER IS CHANGED, SHOW BEFORE & AFTER TOTALIZER READINGS**)

LABOR CHARGES					MATERIAL CHARGES			
	TIME HRS.	TIME MIN.	RATE	AMOUNT	MATERIAL DESCRIPTION	QTY.	PRICE	AMOUNT
Removed sewage water from site 550 gls. work request per KET	1	30	36.50	54 75				
Travel & pump off Coordinate with U-3538	2	30		91 25				
Attn: Rick Sisk								
					Rural water removed from site	550	USE	550 00
					Toll	1		1 15

DISPENSER SERIAL NO.	**TOTALIZER READINGS BEFORE	AFTER

ARRIVAL TIME: HR. ___ MIN. ___ DEPART TIME: HR. ___ MIN. ___ TOTAL TIME: 4 00

TOTAL LABOR CHARGE: 146 00

2 RETAIL SALES REPRESENTATIVE

REMARKS

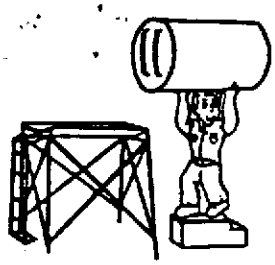
TOTAL MATERIAL	
SALES TAX %	
LABOR CHARGES	146 00
TOTAL ▶	697 15
DATE	4-11-91

SERVICEMAN'S NAME

UNOCAL DEALER: PLEASE READ BOTTOM COPY OF THIS FORM TO CONFIRM THAT THE WORK DESCRIBED HAS BEEN COMPLETED TO YOUR SATISFACTION

DEALER'S SIGNATURE

FORM 3-8811 (REV. 10-85) PRINTED IN U.S.A.



Armour Petroleum Service and Equipment Corporation

SINCE 1980

P.O. BOX 507 • VACAVILLE, CA 95696-0507

WELL MONITORING / SAMPLING
DRUM DATA SHEET
(ATTACH TO EVERY WORKSHEET)
FILL IN ALL BLANKS

FACILITY NAME: 11-0746

ADDRESS: 3943 Broadway Oakland Ca

NUMBER OF DRUMS ON SITE: 10

ARE DRUMS LABELED? YES: ✓ NO: _____

IF YES, DESCRIBE: _____ OIL CO: _____ ENGINEER: _____

WHAT DATE IS MARKED ON DATE CONTAINER FILLED? _____

WHAT DATE IN MARKED ON EXPECTED REMOVAL DATE?: _____

ARE DRUMS NUMBERED? YES: ✓ NO: _____

DRUM	TYPE	GAL. H_2O	GAL. GAS.	GAL. REMOVED	GAL. LEFT ON SITE.	COMMENTS:
3-25-91	E	55gl	0	55gl	0	6-25-91
3-25-91	E	55gl	0	55gl	0	6-25-91
3-25-91	E	55gl	0	55gl	0	6-25-91
4-1-91	E	55gl	0	55gl	0	7-1-91
4-1-91	E	55gl	0	55gl	0	7-1-91
4-1-91	E	55gl	0	55gl	0	7-1-91
4-8-91	E	55gl	0	55gl	0	7-8-91
4-8-91	E	55gl	0	55gl	0	7-8-91
4-8-91	E	55gl	0	55gl	0	7-8-91
4-8-91	E	55gl	0	55gl	0	7-8-91

TOTAL GAL. REMOVE: 550 EMPTY BARRELS LEFT ON SITE: 10

FIELD TECHICIAN: Jonathan Tarry DATE: 4-11-91

ARMOUR PETROLEUM SERVICE and EQUIPMENT CORPORATION

P.O. BOX 507, VACAVILLE, CA. 95696-0507

SHIPPING PAPER

PAGE# 1/3

TO: SOLANO COMMUNITY COLLEGE
1600 California Drive
Vacaville, California.

FROM:
11-0746
3943 Broadway
Oakland Ca

QTY	HM	DESCRIPTION	WEIGHT /GALLONS
( ) 55 gallon drum		Gasoline, Flammable liquid UN1203	
( ) 55 gallon drum		Diesel Fuel, Combustible liquid UN1993	
(10) 55 gallon drum	✓	> 99% water < 1% Fuel Combustible Liquid, UN1993	550 gl
	✓	Placards Provided for this Load	

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SIGNED: Jonathan T Tenny DATE 4-11-91

SHIPPER: U-0746
PER: MEZ
DATE: 4-11-91

CARRIER'S # CA 10759
VEHICLE # 4B3604

DRIVER PRE-TRIP INSPECTION

AREA INSPECTED	CHECKED	PROBLEMS
SERVICE BRAKES INCLUDING TRAILER BRAKE CONNECTIONS	✓	
PARKING (HAND) BRAKE	✓	
STEERING MECHANISM (PLAY?)	✓	
LIGHTING DEVICES AND REFELCETORS	✓	
TIRES (PRESSURE?)	✓	
HORN	✓	
WINDSHIELD WIPERS	✓	
REAR VISION MIRRORS	✓	
BACK - UP PLACARDS & BARREL LABLES (BEHIND SEAT)	✓	
WHEELS AND RIMS , LUGS	✓	
EMERGENCY EQUIPMENT:		
FIRST AID KIT	✓	
HIGHWAY WARNING TRIANGLES	✓	
FIRE EXTINGUISHER	✓	
LOAD SECURE	✓	
FUST KIT FOR VEHICLE	✓	
OIL LEVEL	✓	
BRAKE FLUID LEVEL	✓	
COOLANT LEVEL	✓	
BATTERY	✓	

☐ NO DEFICIENCIES FOUND

COMMENTS:

EQUIPMENT CHECK

COMPRESSOR		
ENGINE FLUID (OIL) LEVEL	✓	
COMPRESSOR FLUID (OIL) LEVEL	✓	
FUEL	✓	
FIRE-UP	✓	
BACK- UP SPARK PLUG(S)	✓	
GASOLINE CAN ON- BOARD AND FULL	✓	
PUMP PROPERLY PURGED	✓	

VEHICLE # GMC 8000 LICENSE # 4D36234

SIGNATURE/DATE: [signature] 4-11-91

Emergency Responce #
Day - 707-437-6668
Night - 707 - 448-1241

3674

FAIRFIELD, CA
(707) 437-6668

SACRAMENTO, CA
(916) 441-2886

FAX NUMBER
(707) 437-4357

GENERAL CONTRACTOR
NUMBER 498721

ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION

SINCE 1980

INVOICE

17109

Please Pay from this invoice

REMIT TO:
P.O. BOX 507
VACAVILLE, CA 95696-0507

SOLD TO Unocal Corp
ADDRESS 2000 Crow Canyon Place #400
CITY San Ramon Ca 94583

SHIP TO Unocal 0746
ADDRESS 3943 Broadway
CITY Oakland Ca

CUSTOMER ORDER NO.	ACCOUNT NUMBER	TERMS	SALESMAN	INVOICE DATE
B70135	EEB001	Net 30	MD	3-25-91

	ORDERED	B/O	SHIPPED	DESCRIPTION	UNIT PRICE	AMOUNT
1						
2						
3				[illegible] MTO [illegible]		
4				[illegible]		
5				[illegible]		
6				#11-0746 as requested [illegible] KEI		
7						
8						
9						
10						
11						
12						
13						
14						
15				120-25-0746-920-367-51-1919262-A83189		
16						
17						
18						

APPROVED
APR 08 1991
C. M. DOMINGUEZ

APPROVED
MAR 28 1991
RICK M. SISK

TITLE TO THE FOREGOING GOODS SHALL NOT PASS TO CUSTOMER UNTIL TOTAL AMOUNTS SHOWN ON INVOICE HAVE BEEN PAID IN FULL TO ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION. IN THE EVENT OF EFFORTS OR LEGAL PROCEEDINGS TO ENFORCE THE COLLECTION OF SUCH SUMS DUE HEREIN, CUSTOMER AGREES TO PAY REASONABLE ATTORNEY'S FEES.

A **finance charge** of 1½% per month, which is an **annual percentage rate** of **18%**, is charged on all past due accounts.

SIGNATURE | DATE DELIVERED

SUBTOTAL	
TAX	
20"	1.15
1.25	200.00
FREIGHT	
LABOR	109.51
TOTAL $	310.66

Thank You

BLANKET CONTRACT NO. B0010R

Maintenance / Repair Order
Unocal Refining & Marketing Division

UNOCAL 76

CONTRACTOR'S NAME: Armour Petroleum Service + Equip. Corp.

SERVICE STATION ADDRESS: 3943 Broadway, Oakland CA

FIELD NO.

STATION NO. 0746

ITEMS WORKED ON (SHOW MFG. NAMES & SERIAL NOS.)

WORK DESCRIPTION (IF PUMP TOTALIZER IS CHANGED, SHOW BEFORE & AFTER TOTALIZER READINGS**)

LABOR CHARGES				MATERIAL DESCRIPTION	MATERIAL CHARGES		
TIME HRS.	TIME MIN.	RATE	AMOUNT		QTY.	PRICE	AMOUNT
1	00	36.50	36.50				
2	00	36.50	73.00				
				Rinse water removed from site	200	USE	20.00
				Toll	1		1.15

Purged 200 gallons of H_2O from (4) of (9) 55 gallon barrels on site.

(9) empty 55 gallon barrels left on site.

Request for work per KET

Typical dump-off

Conjunctive with U-2656 and U-6179

Attn: Rick Sisk

DISPENSER SERIAL NO.	**TOTALIZER READINGS BEFORE	AFTER

ARRIVAL TIME	HR.	MIN.	DEPART TIME	HR.	MIN.	TOTAL TIME
						3.00

TOTAL LABOR CHARGE: 109.50

2 RETAIL SALES REPRESENTATIVE

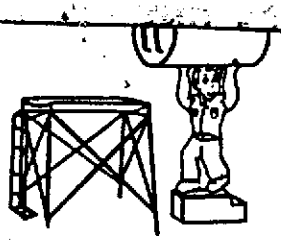
REMARKS

TOTAL MATERIAL	
SALES TAX %	
LABOR CHARGES	109.50
TOTAL	$ 110.65

SERVICEMAN'S NAME

DEALER'S SIGNATURE X

DATE 3-22-91



Armour Petroleum Service and Equipment Corporation

SINCE 1980

P.O. BOX 507 • VACAVILLE, CA 95696-0507

WELL MONITORING / SAMPLING
DRUM DATA SHEET
(ATTACH TO EVERY WORKSHEET)
FILL IN ALL BLANKS

FACILITY NAME: Unocal # 0746

ADDRESS: 3943 Broadway, Oakland, CA.

NUMBER OF DRUMS ON SITE: 9

ARE DRUMS LABELED? YES: 4 NO: 5

IF YES, DESCRIBE: _____ OIL CO: _____ ENGINEER: Nuber

WHAT DATE IS MARKED ON DATE CONTAINER FILLED? N-A

WHAT DATE IN MARKED ON EXPECTED REMOVAL DATE?: N-A

ARE DRUMS NUMBERED? YES: _____ NO: _____

DRUM	TYPE	GAL. H_2O	GAL. GAS.	GAL. REMOVED	GAL. LEFT ON SITE.	COMMENTS:
1	E	54	—	54	—	
2	E	49	—	49	3	sludge - rust
3	E	54	—	54	—	
4	E	43	—	43	—	
5	E	—	—	—	—	empty
6	E	—	—	—	—	empty
7	E	—	—	—	—	empty
8	E	—	—	—	—	empty
9	E	—	—	—	—	empty
10						

TOTAL GAL. REMOVE: 200 EMPTY BARRELS LEFT ON SITE: 9

FIELD TECHICIAN: Joseph Thompson DATE: 3-22-91

ARMOUR PETROLEUM SERVICE and EQUIPMENT CORPORATION

P.O. BOX 507, YACAVILLE, CA. 95696-0507

SHIPPING PAPER

PAGE # 3 of 3

TO: SOLANO COMMUNITY COLLEGE
1600 California Drive
Yacaville, California.

FROM:
Unocal # 0746
3943 Broadway
Oakland, CA.

QTY	HM	DESCRIPTION	WEIGHT /GALLONS
( ) 55 gallon drum		Gasoline, Flammable liquid UN1203	
( ) 55 gallon drum		Diesel Fuel, Combustible liquid UN1993	
(4) 55 gallon drum	X	> 99% water < 1% Fuel Combustible Liquid, UN1993	200 Gallons
	yes	Placards Provided for this Load	

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SIGNED: Joseph F. Thompson Jr. DATE 3-22-91

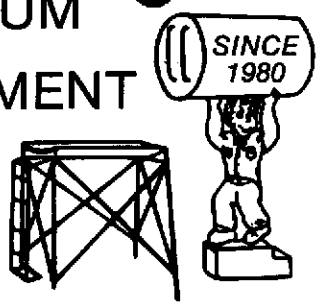
SHIPPER: Unocal
PER: Dubar
DATE: 3-22-91

CARRIER'S # CA 10759
VEHICLE # 4C73175

13429

FAIRFIELD, CA
(707) 437-6668
SACRAMENTO, CA
(916) 441-2886
FAX NUMBER
(707) 437-4357
GENERAL CONTRACTOR
NUMBER 498721

ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION



INVOICE

PC 0746 L8
16961

Please Pay from this invoice

REMIT TO:
P.O. BOX 507
VACAVILLE, CA 95696-0507

SOLD TO Unocal Corp SHIP TO Unocal 746
ADDRESS 2000 Crow Canyon Rd #400 ADDRESS 2323 Broadway
CITY San Ramon Ca 94583 CITY Oakland
Attn: Rick Sick

CUSTOMER ORDER NO.	ACCOUNT NUMBER	TERMS	SALESMAN	INVOICE DATE
K 2010 B	E-R-001	Net 30	MP	3-2-91

	ORDERED	B/O	SHIPPED	DESCRIPTION	UNIT PRICE	AMOUNT
1						
2						
3						
4						
5						
6						
7						
8						
9				130-25-0746-920-367-51-1496262-082490		
10						
11						
12				PROCESSED MAR 21 1991	APPROVED MAR 20 1991 C. M. DOMINGUEZ	
13						
14						
15						
16						
17						
18						

TITLE TO THE FOREGOING GOODS SHALL NOT PASS TO CUSTOMER UNTIL TOTAL AMOUNTS SHOWN ON INVOICE HAVE BEEN PAID IN FULL TO ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION. IN THE EVENT OF EFFORTS OR LEGAL PROCEEDINGS TO ENFORCE THE COLLECTION OF SUCH SUMS DUE HEREIN, CUSTOMER AGREES TO PAY REASONABLE ATTORNEY'S FEES.

A **finance charge** of **1½%** per month, which is an **annual percentage rate** of **18%**, is charged on all past due accounts.

SIGNATURE DATE DELIVERED

SUBTOTAL	
TAX	
[illegible]	1 15
[illegible]	2510 00
FREIGHT	
LABOR	156 [illegible]
TOTAL $	4113 [illegible]

Thank You

Maintenance / Repair Order
Unocal Refining & Marketing Division

UNOCAL 76

BLANKET CONTRACT NO. B2010 B

CONTRACTOR'S NAME: Armour Petroleum Service Equip | SERVICE STATION ADDRESS: 3943 Broadway Oakland | FIELD NO. | STATION NO. 746

ITEMS WORKED ON (SHOW MFG. NAMES & SERIAL NOS.)	LABOR CHARGES				MATERIAL CHARGES			
WORK DESCRIPTION (IF PUMP TOTALIZER IS CHANGED, SHOW BEFORE & AFTER TOTALIZER READINGS**)	TIME HRS.	TIME MIN.	RATE	AMOUNT	MATERIAL DESCRIPTION	QTY.	PRICE	AMOUNT
280 gallons purged from barrells on site	1	00	36.50	36.50				
Left 9 Barells on site empty								
Removed all labels								
Work request per KET								
One way Travel to pump #'s	2	45	36.50	100.38				
Confirmative # 135538 941028								
Attn Rick Sisk								
					Purge water removed from site	280	USE	280.00
					Toll	1		1.15

DISPENSER SERIAL NO.	**TOTALIZER READINGS BEFORE	AFTER	ARRIVAL TIME HR.	MIN.	DEPART TIME HR.	MIN.	TOTAL TIME	TOTAL LABOR CHARGE	2 RETAIL SALES REPRESENTATIVE
							3 45	136.88	

REMARKS

TOTAL MATERIAL	
SALES TAX %	
LABOR CHARGES	136.88
TOTAL	418.03

SERVICEMAN'S NAME: C Barclay

UNOCAL DEALER PLEASE READ BEFORE SIGNING. THIS IS TO CERTIFY THAT THE WORK DESCRIBED ABOVE WAS COMPLETED IN THE TIME INDICATED.

DEALER'S SIGNATURE

DATE 3-6-91

FORM 3-8BTT (REV. 10-85) PRINTED IN U.S.A.

Armour Petroleum Service and Equipment Corporation

SINCE 1980

P.O. BOX 507 • VACAVILLE, CA 95696-0507

WELL MONITORING/SAMPLING

DRUM DATA SHEET

(TO BE ATTACHED TO EVERY WORKSHEET)

FILL OUT ALL THE QUESTIONS

FACILITY NAME & ADDRESS: Unocal 746
3943 Broadway Oakland

NUMBER OF DRUMS ON SITE: 9

ARE DRUMS LABELED? YES: 6 NO: 3

IF YES, DESCRIBE: KEI LABEL: Y OTHER: ____

WHAT DATE IS MARKED ON "DATE CONTAINER FILLED"?: SEE #

WHAT DATE IS MARKED ON "EXPECTED REMOVAL DATE"?: SEE #

ARE DRUMS NUMBERED? YES: 6 NO: 3

GIVE VOLUME OF WATER PUMPED FROM EACH DRUM:

#1 55 2-25-91 5-25-91 E

#2 55 2-25-91 5-25-91 E

#3 55 2-25-91 5-25-91 E

#4 55 3-4-91 6-4-91 E

#5 50 3-4-91 6-4-91 E

#6 ~~5~~ 10 3-4-91 6-4-91 E

#7 no label ~~G~~ E

#8 no label ~~G~~ E

#9 no label ~~G~~ E

#10 ____

280 gallons removed / 9 Empty barrels remain on site

FIELD TECHNICIAN: Charly Myers DATE: 3-6-91

ARMOUR PETROLEUM SERVICE and EQUIPMENT CORPORATION

P.O. BOX 507, VACAVILLE, CA. 95696-0507

SHIPPING PAPER

PAGE # 1 of 3

TO: SOLANO COMMUNITY COLLEGE
1600 California Drive
Vacaville, California.

FROM:
2L 0746
3943 Broadway
Oakland

QTY	HM	DESCRIPTION	WEIGHT /GALLONS
~~(0)~~ 55 gallon drum		Gasoline, Flammable liquid UN1203	
( ) 55 gallon drum		Diesel Fuel, Combustible liquid UN1993	
(6) 55 gallon drum	yes	> 99% water < 1% Fuel Combustible Liquid, UN1993	280 gallons
		Placards Provided for this Load	

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SIGNED: Charles McKinney DATE: 3-5-91

SHIPPER: Unocal CARRIER'S # CA 10759

PER: KEI VEHICLE # 4F73175

DATE: 3-5-91

13417

FAIRFIELD, CA
(707) 437-6668

SACRAMENTO, CA
(916) 441-2886

FAX NUMBER
(707) 437-4357

GENERAL CONTRACTOR
NUMBER 498721

ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION

SINCE 1980

INVOICE

PC 0746 LS

16872

Please Pay from this invoice

REMIT TO:
P.O. BOX 507
VACAVILLE, CA 95696-0507

PROCESSED
MAR 21 1991
C.M. DOMINGUEZ

SOLD TO Unocal Corp
ADDRESS 2000 Crow Canyon Place #400
CITY San Ramon, CA 94583
Attn Rick Sisk

SHIP TO Unocal 0746
ADDRESS 3943 Broadway
CITY Oakland

CUSTOMER ORDER NO.	ACCOUNT NUMBER	TERMS	SALESMAN	INVOICE DATE
B30113B	SFB 001	Net 30	[illegible]	2-26-91

	ORDERED	B/O	SHIPPED	DESCRIPTION	UNIT PRICE	AMOUNT
1						
2						
3				2 men standing by [illegible]		
4				[illegible] 275 gallons		
5				[illegible]		
6				[illegible] at U 0746 as		
7				requested [illegible]		
8						
9						
10						
11				APPROVED	APPROVED	
12				MAR 21 1991	[illegible] 1991	
13						
14				RICK B. SISK	C. M. DOMINGUEZ	
15						
16				~~130-30-0746-920-367-51-1492253-080889~~		
17						
18				130-25-0746-920-367-51-1490262-082496		

TITLE TO THE FOREGOING GOODS SHALL NOT PASS TO CUSTOMER UNTIL TOTAL AMOUNTS SHOWN ON INVOICE HAVE BEEN PAID IN FULL TO ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION. IN THE EVENT OF EFFORTS OR LEGAL PROCEEDINGS TO ENFORCE THE COLLECTION OF SUCH SUMS DUE HEREIN, CUSTOMER AGREES TO PAY REASONABLE ATTORNEY'S FEES.

A **finance charge** of 1½% per month, which is an **annual percentage rate** of 18%, is charged on all past due accounts.

SUBTOTAL	
TAX	
N/T	1.15
USE	275.00
FREIGHT	
LABOR	[illegible].50
TOTAL $	452.[illegible]

SIGNATURE

DATE DELIVERED

Thank You

Maintenance / Repair Order
Unocal Refining & Marketing Division

UNOCAL 76

BLANKET CONTRACT NO. B70108

CONTRACTOR'S NAME: Arcour Petroleum Equipment Co. | SERVICE STATION ADDRESS: 3943 Broadway Oakland | FIELD NO. | STATION NO. 0746

ITEMS WORKED ON (SHOW MFG. NAMES & SERIAL NOS.) / WORK DESCRIPTION (IF PUMP TOTALIZER IS CHANGED, SHOW BEFORE & AFTER TOTALIZER READINGS**)	LABOR CHARGES TIME HRS.	TIME MIN.	RATE	AMOUNT	MATERIAL DESCRIPTION	MATERIAL CHARGES QTY.	PRICE	AMOUNT
	1	00	36.50	36.50				
225 Gallons Purged from Drums 2 Empty 55 Gal Drums left on Site. Work Requested per KEL								
Travel & Pump off	4	00	36.50	146.00				
					Sump water disposed from Site	225	USE	225.00
					Toll	1		1.15

DISPENSER SERIAL NO.	**TOTALIZER READINGS BEFORE	AFTER	ARRIVAL TIME HR.	MIN.	DEPART TIME HR.	MIN.	TOTAL TIME	TOTAL LABOR CHARGE
							5.00	182.50

2 RETAIL SALES REPRESENTATIVE

REMARKS: All Labels Removed

TOTAL MATERIAL	
SALES TAX %	
LABOR CHARGES	182.50
TOTAL	409.65

SERVICEMAN'S NAME

UNOCAL DEALER PLEASE READ BEFORE SIGNING. THIS IS TO CERTIFY THAT THE WORK DESCRIBED ABOVE WAS COMPLETED IN THE TIME INDICATED.

DEALER'S SIGNATURE

DATE 2-23-91

FORM 3-8B11 (REV. 10-85) PRINTED IN U.S.A.

Arthur Petroleum Service
and Equipment Corporation
P.O. BOX 507 • VACAVILLE, CA 95696-0507

SINCE 1980

WELL MONITORING/SAMPLING

DRUM DATA SHEET

(TO BE ATTACHED TO EVERY WORKSHEET)

FILL OUT ALL THE QUESTIONS

FACILITY NAME & ADDRESS: Unocal 0746
3943 Broadway Oakland

NUMBER OF DRUMS ON SITE: 9 (All E Style)

ARE DRUMS LABELED? YES: ✓ NO: _____

IF YES, DESCRIBE: LABEL: Burgy Waste OTHER: _____

WHAT DATE IS MARKED ON "DATE CONTAINER FILLED"?: 2-18-91

WHAT DATE IS MARKED ON "EXPECTED REMOVAL DATE"?: 5-18-91

ARE DRUMS NUMBERED? YES: ✓ NO: _____

GIVE VOLUME OF WATER PUMPED FROM EACH DRUM:

#1 55 E
#2 55 E
#3 55 E
#4 55 E
#5 55 E

275 gallons Total removed
9-Empty Barrels remain on site

#6 MT E
#7 MT E
#8 MT E
#9 MT E
#10 _____

FIELD TECHNICIAN: Dave DATE: 2-23-91

\WMS

VACAVILLE (707) 437-6668
CONTRACTOR'S LICENSE NUMBER 498721
SACRAMENTO (916) 441-2886
FAX (707) 437-4357

ARMOUR PETROLEUM SERVICE and EQUIPMENT CORPORATION

P.O. BOX 507, VACAVILLE, CA. 95696-0507

SHIPPING PAPER

PAGE# 3

TO: SOLANO COMMUNITY COLLEGE
1600 California Drive
Vacaville, California.

FROM:
Unocal 0746
3943 Broadway
Oakland

QTY	HM	DESCRIPTION	WEIGHT /GALLONS
( ) 55 gallon drum		Gasoline, Flammable liquid UN1203	
( ) 55 gallon drum		Diesel Fuel, Combustible liquid UN1993	
(5) 55 gallon drum	✓	> 99% water < 1% Fuel Combustible Liquid, UN1993	275 Gallons Total
	✓	Placards Provided for this Load	

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SIGNED: [signature] DATE: 2-23-91

SHIPPER: Unocal CARRIER'S # CA 10759

PER: KEI VEHICLE # 916MC

DATE: 2-23-91

CONTRA

FORM 3-3811 (REV. 10-85) PRINTED IN U.S.A.

Unocal Refining & Marketing Division
Unocal Corporation
2000 Crow Canyon Place, Suite 400
San Ramon, California 94583
Telephone (415) 867-0760

UNOCAL 76

91 FEB 27 PM 4:07

February 22, 1991

Northern Division

Mr. Gil Wistar
Alameda County
Health Care Services Agency
Hazardous Materials Program
80 Swan Way, Rm. 200
Oakland, California 94621

Unocal Service Station No. 0746
3943 Broadway
Oakland, California

Dear Mr. Wistar:

I am in receipt of you letter dated February 1,1991 concerning the soil and groundwater investigation at the subject service station. In particular, you have reviewed the most recent quarterly report submitted by Kaprealian Engineering (KEI) describing the installation of four additional monitoring wells. Based on your review of this report, you have requested that Unocal submit a Work Plan for the installation of additional wells to define the "zero line" of contamination, together with a report on the first quarter sampling for 1991 by March 15, 1991.

Attached please find a response to this request prepared by KEI. Based on our current sampling schedule, we will be unable to provide the requested report and Work Plan by the original deadline. I am formally requesting an extension of this deadline until April 15, 1991. This extra time will allow KEI to further assess current contaminant levels as well as confirm groundwater flow direction before recommending locations for additional wells.

I hope this request for extension is acceptable. If there are any questions or concerns, please feel free to contact the undersigned at (415) 277-2303.

Sincerely,

Ronald E Bock

Ronald E. Bock
Environmental Engineer

attachment
cc: Mardo Kaprealian

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581

February 19, 1991

Unocal Corporation
2000 Crow Canyon Place, #400
P.O. Box 5155
San Ramon, California 94583

Attention: Mr. Ron Bock

RE: Unocal Service Station #0746
3943 Broadway
Oakland, California

Dear Mr. Bock:

Kaprealian Engineering, Inc. (KEI) has reviewed the letter to Unocal Corporation from the Alameda County Health Care Services Agency (ACHCS) dated February 1, 1991, regarding the subject site. The ACHCS states that additional monitoring wells are needed downgradient of the site to define the "zero edge" of the plume, and is requesting a remedial action plan be developed for the site. The ACHCS has requested Unocal Corporation to submit a work plan for the installation of additional wells, together with a report on the first quarter of sampling for 1991, by March 15, 1991, including a schedule for implementation of a ground water remediation system.

All of the monitoring wells (MW1 through MW9) at the subject site are currently scheduled to be sampled on February 25, 1991, which will be the first quarter of sampling for the new wells (MW6, MW7, MW8 and MW9) installed at the site in October, 1990. The first quarter of monitoring and sampling will enable KEI to confirm the ground water flow direction at the site, as well as the levels of contamination detected in off-site wells MW8 and MW9. This additional data will enable KEI to make a better informed decision as to locations of any additional monitoring wells.

Based on receiving the ground water sample analytical results within two weeks of the scheduled sample date, KEI anticipates submitting the quarterly report by April 15, 1991. The quarterly report will present the results of the monthly monitoring and quarterly sampling, as well as recommendations for additional off-site investigations, including a schedule. It is KEI's intention to develop a remedial action plan upon completion of defining the extent of ground water contamination.

KEI hopes that this letter and the proposed report submittal date are acceptable to the ACHCS. If you have any questions or comments regarding this letter, please contact me at 707/746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Thomas J. Berkins

Thomas J. Berkins
Senior Environmental Engineer

Mardo Kaprealian

Mardo Kaprealian
President

MK:jad\RB

13186
PC0746

FAIRFIELD, CA
(707) 437-6668
SACRAMENTO, CA
(916) 441-2886
FAX NUMBER
(707) 437-4357
GENERAL CONTRACTOR
NUMBER 498721

ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION

SINCE 1980

INVOICE
16737

Please Pay from this invoice

REMIT TO:
P.O. BOX 507
VACAVILLE, CA 95696-0507

SOLD TO: UNOCAL Corp
ADDRESS: 2000 Crow Canyon Place #400
CITY: San Ramon, CA 94583
Attn: Rick Sisk

SHIP TO: UNOCAL 0746
ADDRESS: 3943 Broadway
CITY: Oakland

CUSTOMER ORDER NO.	ACCOUNT NUMBER	TERMS	SALESMAN	INVOICE DATE
B2010B	EEB001	Net 30		2-12-91

	ORDERED	B/O	SHIPPED	DESCRIPTION	UNIT PRICE	AMOUNT
1						
2				[illegible] MSDs [illegible]		
3				with the removal of 495 gallons		
4				[illegible]		
5				[illegible] at U-0746 as		
6				[illegible] per KET		
7						
8				PROCESSED		
9						
10				130-25-0746-920-367-51-1490262-082489		
11				C.M. DOMINGUEZ		
12				APPROVED		
13						
14				FEB 15 1991 APPROVED		
15				RICK D. SISK		
16				FEB 21 1991		
17				C. M. DOMINGUEZ		
18						

TITLE TO THE FOREGOING GOODS SHALL NOT PASS TO CUSTOMER UNTIL TOTAL AMOUNTS SHOWN ON INVOICE HAVE BEEN PAID IN FULL TO ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION. IN THE EVENT OF EFFORTS OR LEGAL PROCEEDINGS TO ENFORCE THE COLLECTION OF SUCH SUMS DUE HEREIN, CUSTOMER AGREES TO PAY REASONABLE ATTORNEY'S FEES.

A **finance charge** of 1½% per month, which is an **annual percentage rate** of 18%, is charged on all past due accounts.

SIGNATURE
DATE DELIVERED

SUBTOTAL	
TAX	
Toll	[illegible]
USE	495.00
FREIGHT	
LABOR	310.55
TOTAL $	807.55

Thank You

Maintenance / Repair Order
Unocal Refining & Marketing Division

UNOCAL 76

BLANKET CONTRACT NO. B2010B

CONTRACTOR'S NAME: Armour Petroleum Service Eqpt | SERVICE STATION ADDRESS: 3943 Broadway Oakland | FIELD NO. | STATION NO. 0746

ITEMS WORKED ON (SHOW MFG. NAMES & SERIAL NOS.) / WORK DESCRIPTION (IF PUMP TOTALIZER IS CHANGED, SHOW BEFORE & AFTER TOTALIZER READINGS**)	LABOR CHARGES TIME HRS.	TIME MIN.	RATE	AMOUNT	MATERIAL DESCRIPTION	MATERIAL CHARGES QTY.	PRICE	AMOUNT
330 Gallons Purged From 9 Drums	1	00	36.50	36	50			
6 Empty E Type Drums Left On Site. 165 Gallons also remain on Site in 3 barrels								
All E Type Drums. 9 Total								
Travel & pump off	4	00	36.50	146	00			
Work requested by KET								
					Purge water removed from site	330	use	330 00
					Toll	1		7 15

DISPENSER SERIAL NO.	**TOTALIZER READINGS BEFORE	AFTER	ARRIVAL TIME	HR.	MIN.	DEPART TIME	HR.	MIN.	TOTAL TIME	TOTAL LABOR CHARGE		2 RETAIL SALES REPRESENTATIVE
									5 00	182	50	

REMARKS

TOTAL MATERIAL	
SALES TAX %	
LABOR CHARGES	182 50
TOTAL	573 65

SERVICEMAN'S NAME: Dave

UNOCAL DEALER PLEASE READ BEFORE SIGNING. THIS IS TO CERTIFY THAT THE WORK DESCRIBED ABOVE WAS COMPLETED IN THE TIME INDICATED. DEALER'S SIGNATURE

DATE: 2-6-91

FORM 3-8811 (REV. 10-85) PRINTED IN U.S.A.

Maintenance / Repair Order
Unocal Refining & Marketing Division

UNOCAL 76

BLANKET CONTRACT NO. B2010B

CONTRACTOR'S NAME: Armour Petroleum Service / Equip
SERVICE STATION ADDRESS: 3943 Broadway Oakland
FIELD NO.:
STATION NO.: 0746

ITEMS WORKED ON (SHOW MFG. NAMES & SERIAL NOS.) / WORK DESCRIPTION (IF PUMP TOTALIZER IS CHANGED, SHOW BEFORE & AFTER TOTALIZER READINGS**)	LABOR CHARGES TIME HRS.	TIME MIN.	RATE	AMOUNT	MATERIAL DESCRIPTION	MATERIAL CHARGES QTY.	PRICE	AMOUNT
	1	00	36.00	36.50				
165 Gallons Purged From Drums								
Left 9 Empty E Type Drums on Site.								
Work requested per KEI								
One way Travel & Pumpoff	2	30	36.00	91.75				
					Purge water removed from site	165	use	165.00
					Toll	1		1.15

DISPENSER SERIAL NO.	**TOTALIZER READINGS BEFORE	AFTER

ARRIVAL TIME: HR. ____ MIN. ____ DEPART TIME: HR. ____ MIN. ____ TOTAL TIME: 3 30
TOTAL LABOR CHARGE: 127.75
2 RETAIL SALES REPRESENTATIVE

REMARKS: All Labels Removed

MATERIAL CHARGES	
TOTAL MATERIAL	
SALES TAX %	
LABOR CHARGES	127.75
TOTAL	293.90

SERVICEMAN'S NAME: Dave

UNOCAL DEALER PLEASE READ BEFORE SIGNING. THIS IS TO CERTIFY THAT THE WORK DESCRIBED ABOVE WAS COMPLETED IN THE TIME INDICATED.
DEALER'S SIGNATURE: A Robert Co.

DATE: 2-8-91

FORM 3-8611 (REV. 10-85) PRINTED IN U.S.A.

Armour Petroleum Service and Equipment Corporation

SINCE 1980

P.O. BOX 507 • VACAVILLE, CA 95696-0507

WELL MONITORING/SAMPLING

DRUM DATA SHEET

(TO BE ATTACHED TO EVERY WORKSHEET)

FILL OUT ALL THE QUESTIONS

FACILITY NAME & ADDRESS: Unocal 0746

3943 Broadway Oakland

NUMBER OF DRUMS ON SITE: 9

ARE DRUMS LABELED? YES: ✓ NO: _____

IF YES, DESCRIBE: LABEL: Purge Water OTHER: _____

WHAT DATE IS MARKED ON "DATE CONTAINER FILLED"?: 1-28-91

WHAT DATE IS MARKED ON "EXPECTED REMOVAL DATE"?: 4-28-91

ARE DRUMS NUMBERED? YES: ✓ NO: _____

GIVE VOLUME OF WATER PUMPED FROM EACH DRUM:

#1 55

#2 55

#3 55

#4 55

#5 55

330 Gallons Total removed

6 Empty E Barrels on site

3 barrels full

#6 55

#7 _____

#8 _____

#9 _____

#10 _____

FIELD TECHNICIAN: Dave DATE: 2-6-91

Armour Petroleum Service
and Equipment Corporation

SINCE 1980

P.O. BOX 507 • VACAVILLE, CA 95696-0507

WELL MONITORING/SAMPLING

DRUM DATA SHEET

(TO BE ATTACHED TO EVERY WORKSHEET)

FILL OUT ALL THE QUESTIONS

FACILITY NAME & ADDRESS: Unocal 0746
3943 Broadway Oakland Ca.

NUMBER OF DRUMS ON SITE: 9

ARE DRUMS LABELED? YES: ✓ NO: _____

IF YES, DESCRIBE: LABEL: Borge Water OTHER: _____

WHAT DATE IS MARKED ON "DATE CONTAINER FILLED"?: 2-4-91

WHAT DATE IS MARKED ON "EXPECTED REMOVAL DATE"?: 5-4-91

ARE DRUMS NUMBERED? YES: ✓ NO: _____

GIVE VOLUME OF WATER PUMPED FROM EACH DRUM:

#1 55 E

#2 55 E

#3 55 E

#4 _____

#5 _____

#6 _____

#7 _____

#8 _____

#9 _____

#10 _____

165 Gallons Total removed
Total of 9 Empty E barrel removed ow site

FIELD TECHNICIAN: Dave DATE: 2-8-91

ARMOUR PETROLEUM SERVICE and EQUIPMENT CORPORATION

P.O. BOX 507, VACAVILLE, CA. 95696-0507

SHIPPING PAPER

PAGE# 1

TO: SOLANO COMMUNITY COLLEGE
1600 California Drive
Vacaville, California.

FROM:
Unocal 0746
3943 Broadway
Oakland

QTY	HM	DESCRIPTION	WEIGHT /GALLONS
( ) 55 gallon drum		Gasoline, Flammable liquid UN1203	
( ) 55 gallon drum		Diesel Fuel, Combustible liquid UN1993	
(6) 55 gallon drum	✓	> 99% water < 1% Fuel Combustible Liquid, UN1993	330 Gallons Total
	✓	Placards Provided for this Load	

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SIGNED: [signature] DATE: 2-6-91

SHIPPER: Unocal CARRIER'S # CA 10759

PER: KEE VEHICLE # 1257391

DATE: 2-6-91

ARMOUR PETROLEUM SERVICE and EQUIPMENT CORPORATION

P.O. BOX 507, YACAVILLE, CA. 95696-0507

SHIPPING PAPER

PAGE# 1

TO: SOLANO COMMUNITY COLLEGE
1600 California Drive
Yacaville, California.

FROM:
Unocal 0746
3943 Broadway
Oakland Ca.

QTY	HM	DESCRIPTION	WEIGHT /GALLONS
( ) 55 gallon drum		Gasoline, Flammable liquid UN1203	
( ) 55 gallon drum		Diesel Fuel, Combustible liquid UN1993	
(3) 55 gallon drum	✓	> 99% water < 1% Fuel Combustible Liquid, UN1993	165 Gallons Total
	✓	Placards Provided for this Load	

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SIGNED: L Jamish Schneider DATE: 2-8-91

SHIPPER: Unocal CARRIER'S # CA 10759

PER: K.E.I VEHICLE # 4036234

DATE: 2-8-91

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
Hazardous Materials Program
80 Swan Way, Rm. 200
Oakland, CA 94621
(415)

February 1, 1991

Mr. Ron Bock
Unocal Refining & Marketing
P.O. Box 5155
San Ramon, CA 94583

Re: **Groundwater investigation at Unocal #0746, 3943 Broadway, Oakland**

Dear Mr. Bock:

Thank you for submitting Kaprealian Engineering's December 17 report on the above site. This document describes the installation of four additional monitoring wells at this location, including two off-site, downgradient wells. Groundwater contamination is widespread, apparently extending beyond the furthest downgradient well, MW-9. Based on upgradient wells' analytical data, the hydrocarbons in groundwater have resulted from previous releases from the facility's underground tanks.

Analytical data from the Kaprealian report shows that the groundwater contaminant plume may extend further downgradient and cross-gradient along the Broadway right-of-way. Thus, the plume must be defined towards the south, southeast, and southwest; this means that additional monitoring wells need to be placed along Broadway, within the street and/or on its sidewalks. We are requiring that Unocal develop hard data to define the "zero edge" of the plume. In this respect, the upgradient direction has been defined adequately, and no further wells are necessary to the north or northeast.

Because of the high levels of dissolved gasoline and benzene in the plume, as well as its extent, we are requiring that Unocal begin to develop a remedial action plan for this site. The purpose of the groundwater remediation will be treatment to drinking water standards, i.e., reducing benzene to below state action levels. Such a plan will require the following general elements:

- a monitoring network within and surrounding the plume, to provide an adequate number of data points;

- pump-test data and information on site-specific hydrologic characteristics, including a capture-zone analysis;

- specific information such as location of extraction well(s), groundwater treatment/disposal methods, system maintenance plans, and system evaluation/monitoring protocol; and

- an implementation schedule for all phases of remedial action.

Please submit a work plan for the installation of additional monitoring wells, together with a report on 1st quarter 1991 sampling, to this office by **March 15, 1991.** Your proposal must include a schedule for installation of the wells and for the implementation of the various elements of groundwater remediation. Copies of this and all technical reports must be sent to the Regional Water Quality Control Board in Oakland, and signed by an appropriate professional.

Because we are overseeing this site under the designated authority of the Water Board, this letter constitutes a formal request for technical reports, per Sec. 13267(b) of the California Water Code. Failure to respond in a timely manner could result in civil liabilities under the Water Code of up to $1,000 per day. Other violations of California law, such as Sec. 25299.37 of the Health and Safety Code, may also be cited.

If you have any questions about this letter or about remediation requirements established by the RWQCB, please contact me at 271-4320.

Sincerely,

Gilbert M. Wistar

Gil Wistar
Hazardous Materials Specialist

cc: Lester Feldman, San Francisco Bay RWQCB
Rafat Shahid, Asst. Agency Director, Environmental Health
files

12764

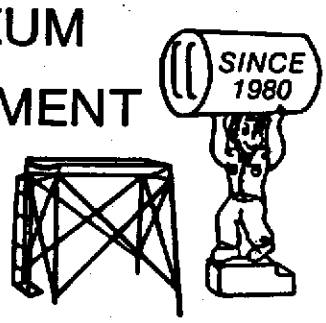
FAIRFIELD, CA
(707) 437-6668

SACRAMENTO, CA
(916) 441-2886

FAX NUMBER
(707) 437-4357

GENERAL CONTRACTOR
NUMBER 498721

ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION



INVOICE

16346

Please Pay from this invoice

REMIT TO:
P.O. BOX 507
VACAVILLE, CA 95696-0507

SOLD TO UNOCAL CORPORATION
ADDRESS 2000 CROW CANYON PLACE #400
CITY SAN RAMON, CA 94583
ATTN: RICK SISK

SHIP TO UNOCAL 0746
ADDRESS 394 BROADWAY ST.
CITY OAKLAND, CA

CUSTOMER ORDER NO.	ACCOUNT NUMBER	TERMS	SALESMAN	INVOICE DATE
B2010B	EEB001	NET 30	MLaa	12-31-90

ORDERED	B/O	SHIPPED	DESCRIPTION	UNIT PRICE	AMOUNT
			See attached WO for work performed at Unocal 0746 to remove 330 gallons of liquid and transport from site as requested by Jim KEI		
			PROCESSED FEB 25 1991 C.M. DOMINGUEZ		
			APPROVED JAN 10 1991 C.M. DOMINGUEZ		
			130-30-0746-920-367-51-1542253-080889		
			SUBTOTAL		
			TAX TOLL	1	15
			USE	330	00
			BARREL HANDLING	9	00
			FREIGHT		
			LABOR	182	50
			TOTAL $	522	65

TITLE TO THE FOREGOING GOODS SHALL NOT PASS TO CUSTOMER UNTIL TOTAL AMOUNTS SHOWN ON INVOICE HAVE BEEN PAID IN FULL TO ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION. IN THE EVENT OF EFFORTS OR LEGAL PROCEEDINGS TO ENFORCE THE COLLECTION OF SUCH SUMS DUE HEREIN, CUSTOMER AGREES TO PAY REASONABLE ATTORNEY'S FEES.

A **finance charge** of 1½% per month, which is an **annual percentage rate** of 18%, is charged on all past due accounts.

SIGNATURE

DATE DELIVERED 12-31-90

Maintenance / Repair Order
Unocal Refining & Marketing Division

BLANKET CONTRACT NO. B2010B

UNOCAL 76 H-0746

CONTRACTOR'S NAME: ARMOR Petroleum Service | SERVICE STATION ADDRESS: 394 Beaudan ST Oakland Ca. | FIELD NO. | STATION NO. 0746

ITEMS WORKED ON (SHOW MFG. NAMES & SERIAL NOS.) / WORK DESCRIPTION (IF PUMP TOTALIZER IS CHANGED, SHOW BEFORE & AFTER TOTALIZER READINGS**)	LABOR CHARGES TIME HRS.	TIME MIN.	RATE	AMOUNT	MATERIAL DESCRIPTION	MATERIAL CHARGES QTY.	PRICE	AMOUNT
Removed purge water from site 330 gl. Also took one sprayed from site.	1	-	36 50	36 50				
Clean Requested per KEL								
Travel & Pump Off	4	-	36 50	146 00				
					Purge Water. Removed from Site	330	USE	330 00
					Barrel Handling (Removal)	1	9 00	9 00
					Toll			15

DISPENSER SERIAL NO.	**TOTALIZER READINGS BEFORE	AFTER	ARRIVAL TIME	HR.	MIN.	DEPART TIME	HR.	MIN.	TOTAL TIME	TOTAL LABOR CHARGE	2 RETAIL SALES REPRESENTATIVE
									5 1	182 50	

REMARKS

TOTAL MATERIAL	
SALES TAX %	
LABOR CHARGES	182 50
TOTAL ▶	522 65

SERVICEMAN'S NAME

UNOCAL DEALER PLEASE READ BEFORE SIGNING. THIS IS TO CERTIFY THAT THE WORK DESCRIBED ABOVE WAS COMPLETED IN THE TIME INDICATED.

DEALER'S SIGNATURE

DATE 12-31-90

FORM 3-6811 (REV. 10-85) PRINTED IN U.S.A.

ARMOUR PETROLEUM SERVICE and EQUIPMENT CORPORATION

P.O. BOX 507, VACAVILLE, CA. 95696-0507

SHIPPING PAPER

PAGE # 1 of 1

TO: SOLANO COMMUNITY COLLEGE
1600 California Drive
Vacaville, California.

FROM: U-0746
394 Broadway St
Oakland Ca.

QTY	HM	DESCRIPTION	WEIGHT /GALLONS
( ) 55 gallon drum		Gasoline, Flammable liquid UN1203	
( ) 55 gallon drum		Diesel Fuel, Combustible liquid UN1993	
(6) 55 gallon drum	✓	> 99% water < 1% Fuel Combustible Liquid, UN1993	33051
	1/15	Placards Provided for this Load	

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SIGNED: Jonathan Tam DATE: 12-31-90

SHIPPER: KET-U-0746 CARRIER'S # CA 10759

PER: KET VEHICLE # 64554G

DATE: 12-31-90

Armour Petroleum Service and Equipment Corporation
SINCE 1980
P.O. BOX 507 • VACAVILLE, CA 95696-0507

WELL MONITORING/SAMPLING

DRUM DATA SHEET

(TO BE ATTACHED TO EVERY WORKSHEET)

FILL OUT ALL THE QUESTIONS

FACILITY NAME & ADDRESS: U-0746
394 Broadway Oakland Ca

NUMBER OF DRUMS ON SITE: 6

ARE DRUMS LABELED? YES: / NO: _____

IF YES, DESCRIBE: LABEL: _____ OTHER: _____

WHAT DATE IS MARKED ON "DATE CONTAINER FILLED"?: _____

WHAT DATE IS MARKED ON "EXPECTED REMOVAL DATE"?: _____

ARE DRUMS NUMBERED? YES: / NO: _____

GIVE VOLUME OF WATER PUMPED FROM EACH DRUM:

#1 Filled 11-7-90 Removal 12-7-91 55gl
#2 11-7-90 12-7-91 55gl
#3 11-7-90 2-7-91 55gl
#4 12-8-90 3-8-91 55gl
#5 12-8-90 3-8-91 55gl
#6 12-8-90 3-8-91 55gl
#7
#8
#9
#10

Total 330 gallons removed & also ~~took~~ one barrel from site.

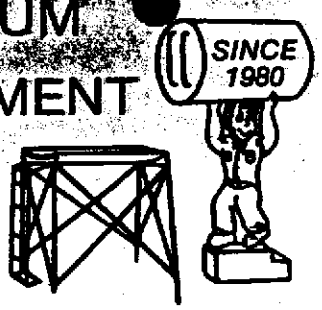
FIELD TECHNICIAN: Jonathan Tong DATE: 12-31-90

CONTRACTOR'S LICENSE NUMBER 498721
VACAVILLE (707) 437-6668 SACRAMENTO (916) 441-2886 FAX (707) 437-4357

12759

FAIRFIELD, CA
(707) 437-[illegible]
SACRAMENTO, CA
(916) 441-2886
FAX NUMBER
(707) 437-4357
GENERAL CONTRACTOR
NUMBER 498721

ARMOUR PETROLEUM
SERVICE AND EQUIPMENT CORPORATION



INVOICE

16240

Please Pay from this invoice

REMIT TO:
P.O. BOX 507
VACAVILLE, CA 95696-0507

SOLD TO Unocal Corporation
ADDRESS 3000 Crow Canyon Place #400
CITY San Ramon, CA 94583
ATTN: Rick Sisk

SHIP TO Unocal 0746
ADDRESS 3943 Broadway
CITY Oakland, CA

CUSTOMER ORDER NO.	ACCOUNT NUMBER	TERMS	SALESMAN	INVOICE DATE
B#2010B	EE8001	Net 30	MKay	12/19/90

ORDERED	B/O	SHIPPED	DESCRIPTION	UNIT PRICE	AMOUNT
			See attached PO for support documentation for the removal of 10 barrels from site as requested per EEI		
			PROCESSED FEB 25 1991 C.M. DOMINGUEZ		
			130-30-0746-920-367-51-1542253-080889		
			APPROVED JAN 02 1991 C.M. DOMINGUEZ		

TITLE TO THE FOREGOING GOODS SHALL NOT PASS TO CUSTOMER UNTIL TOTAL AMOUNTS SHOWN ON INVOICE HAVE BEEN PAID IN FULL TO ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION. IN THE EVENT OF EFFORTS OR LEGAL PROCEEDINGS TO ENFORCE THE COLLECTION OF SUCH SUMS DUE HEREIN, CUSTOMER AGREES TO PAY REASONABLE ATTORNEY'S FEES.

A **finance charge** of 1½% per month, which is an **annual percentage rate** of 18%, is charged on all past due accounts.

SUBTOTAL	
TAX	
Barrel Handling	90 00
FREIGHT	
LABOR	164 25
TOTAL $	254 25

SIGNATURE

DATE DELIVERED 12-17-90

Thank You

ACCOUNTING COPY

Maintenance / Repair Order
Unocal Refining & Marketing Division

UNOCAL 76 0746

BLANKET CONTRACT NO. B3010B

NAME	SERVICE STATION ADDRESS	FIELD NO.	STATION NO.
[illegible] Petroleum Service	3943 Broadway X 40th		0746

ITEMS WORKED ON (SHOW MFG. NAMES & SERIAL NOS.) WORK DESCRIPTION (IF PUMP TOTALIZER IS CHANGED, SHOW BEFORE & AFTER TOTALIZER READINGS**)	LABOR CHARGES TIME HRS.	MIN.	RATE	AMOUNT	MATERIAL DESCRIPTION	MATERIAL CHARGES QTY.	PRICE	AMOUNT
[illegible] 10 barrels from site	1	00	36.50	36.50				
[illegible] Pump on site								
[illegible] for barrel								
[illegible] per [illegible]								
[illegible] Tank & diagonal	3½		36.50	127.75				
[illegible] Tank w/1028					Barrel Handling (Removal)	10	9.00	90.00

**TOTALIZER READINGS BEFORE	AFTER	ARRIVAL TIME HR.	MIN.	DEPART TIME HR.	MIN.	TOTAL TIME	TOTAL LABOR CHARGE	UNOCAL MAINT. REPRESENTATIVE
						4½	164.25	3

REMARKS

TOTAL MATERIAL	
SALES TAX %	
LABOR CHARGES	164.25
TOTAL	254.25
DATE	12-17-90

SERVICEMAN'S NAME [signature]

UNOCAL DEALER PLEASE READ BEFORE SIGNING. THIS IS TO CERTIFY THAT THE WORK DESCRIBED ABOVE WAS COMPLETED IN THE TIME INDICATED.

DEALER'S SIGNATURE [signature]

FORM 3-[illegible] (REV. 10-85) PRINTED IN U.S.A.

Armour Petroleum Service and Equipment Corporation

SINCE 1980

P.O. BOX 507 • VACAVILLE, CA 95696-0507

Unocal 0746.

WELL MONITORING/SAMPLING

DRUM DATA SHEET

(TO BE ATTACHED TO EVERY WORKSHEET)

FILL OUT ALL THE QUESTIONS

FACILITY NAME & ADDRESS: 3943 Broadway & 40th Oakland Co.

NUMBER OF DRUMS ON SITE: 6 left on site full

ARE DRUMS LABELED? YES: ✓ NO: _____

IF YES, DESCRIBE: LABEL: _____ OTHER: _____

WHAT DATE IS MARKED ON "DATE CONTAINER FILLED"?: _____

WHAT DATE IS MARKED ON "EXPECTED REMOVAL DATE"?: _____

ARE DRUMS NUMBERED? YES: ✓ NO: ✓

GIVE VOLUME OF WATER PUMPED FROM EACH DRUM:

#1 Filled - 1-7-90 Removal - 2-7-91 55 gl

#2 11-7-90 2-7-91 55 gl

#3 11-7-90 2-7-91 55 gl

#4 12-8-90 2-8-91 55 gl

#5 12-8-90 3-8-91 55 gl

#6 12-8-90 3-8-91 55 gl

#7 _____

#8 _____

#9 _____

#10 _____

Removed 10 barrels from Site
6 full Barrels remain on site

FIELD TECHNICIAN: Jonathan Tinney DATE: 12-17-90

FAIRFIELD, CA
(707) 437-6668
SACRAMENTO, CA
(916) 441-2886
FAX NUMBER
(707) 437-4357
GENERAL CONTRACTOR
NUMBER 498721

ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION

SINCE 1980

INVOICE

15852

Please Pay from this invoice

REMIT TO:
P.O. BOX 507
VACAVILLE, CA 95696-0507

SOLD TO Unocal Corporation
ADDRESS 2000 Crow Canyon Place #400
CITY San Ramon, CA 94583
ATTN: Rick Ssk

SHIP TO Unocal 0746
ADDRESS 3943 Broadway
CITY Oakland, CA

CUSTOMER ORDER NO.	ACCOUNT NUMBER	TERMS	SALESMAN	INVOICE DATE
B2010A	EEB001	Net 30	MKE	11/6/90

ORDERED	B/O	SHIPPED	DESCRIPTION	UNIT PRICE	AMOUNT
			See ATTACHED MRO's FOR WORK PERFORMED AT Unocal 0746 To Remove 770 GALLONS OF Liquid From 15 ON-SITE BARRELS AS Requested per KEE.		
			130-25-0746-920-307-51-1490262-082489		

PROCESSED
FEB 25 1991
C.M. DOMINGUEZ

APPROVED
NOV 26 1990
C. M. DOMINGUEZ

TITLE TO THE FOREGOING GOODS SHALL NOT PASS TO CUSTOMER UNTIL TOTAL AMOUNTS SHOWN ON INVOICE HAVE BEEN PAID IN FULL TO ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION. IN THE EVENT OF EFFORTS OR LEGAL PROCEEDINGS TO ENFORCE THE COLLECTION OF SUCH SUMS DUE HEREIN, CUSTOMER AGREES TO PAY REASONABLE ATTORNEY'S FEES.

A **finance charge** of 1½% per month, which is an **annual percentage rate** of 18%, is charged on all past due accounts.

SIGNATURE

DATE DELIVERED 11-1-90

SUBTOTAL	
TAX	
USE	770 00
TBIs	2 30
FREIGHT	
LABOR	379 50
TOTAL $	1151 80

Maintenance / Repair Order
Unocal Refining & Marketing Division

UNOCAL 76

BLANKET CONTRACT NO. B2010A

CONTRACTOR'S NAME: Armour Petroleum | SERVICE STATION ADDRESS: 3943 Broadway Oakland | FIELD NO. | STATION NO. 0746

ITEMS WORKED ON (SHOW MFG. NAMES & SERIAL NOS.)

WORK DESCRIPTION (IF PUMP TOTALIZER IS CHANGED, SHOW BEFORE & AFTER TOTALIZER READINGS**)	LABOR CHARGES TIME HRS.	TIME MIN.	RATE	AMOUNT	MATERIAL DESCRIPTION	MATERIAL CHARGES QTY.	PRICE	AMOUNT
Purged 190 Gallons from 4 Drums Left 14 Drums on Site (12 ace full)		30	34 50	17 25				
(Work Requested per KEI								
1 - Way Travel & Pump Off	3		34 50	103 50				
					Purge Water Removed from Site	190	USE	190 00
					Toll			1 15

DISPENSER SERIAL NO.	**TOTALIZER READINGS BEFORE	AFTER	ARRIVAL TIME HR.	MIN.	DEPART. TIME HR.	MIN.	TOTAL TIME	TOTAL LABOR CHARGE	2 RETAIL SALES REPRESENTATIVE
							3 1/2	120 75	

REMARKS

TOTAL MATERIAL	
SALES TAX %	
LABOR CHARGES	120 75
TOTAL	▶ 311 90

SERVICEMAN'S NAME: Dave

UNOCAL DEALER PLEASE READ BEFORE SIGNING. THIS IS TO CERTIFY THAT THE WORK DESCRIBED ABOVE WAS COMPLETED IN THE TIME INDICATED.

DEALER'S SIGNATURE:

DATE: 10-31-90

FORM 6-6811 (REV. 10-85) PRINTED IN U.S.A.

Maintenance / Repair Order

Unocal Refining & Marketing Division

UNOCAL

BLANKET CONTRACT NO. 330154

CONTRACTOR'S NAME: Armour Petroleum

SERVICE STATION ADDRESS: 3943 Broadway Oakland

FIELD NO.

STATION NO. 0746

ITEMS WORKED ON (SHOW MFG. NAMES & SERIAL NOS.) / WORK DESCRIPTION (IF PUMP TOTALIZER IS CHANGED, SHOW BEFORE & AFTER TOTALIZER READINGS**)	LABOR CHARGES TIME HRS.	TIME MIN.	RATE	AMOUNT	MATERIAL DESCRIPTION	MATERIAL CHARGES QTY.	PRICE	AMOUNT
Purged 580 Gallons from 11 Drums	1	-	34 50	34 50				
Left 15 Empty Drums on Site								
Work Requested per Ket								
Travel and Pump Out	6	1/2	34 50	224 25				
					Purge Water Emptied from Site	580	USE	580 00
					Toll			1 75

DISPENSER SERIAL NO.	**TOTALIZER READINGS BEFORE	AFTER

ARRIVAL TIME	HR.	MIN.	DEPART TIME	HR.	MIN.	TOTAL TIME	TOTAL LABOR CHARGE
						7 1/2	258 75

2 RETAIL SALES REPRESENTATIVE

REMARKS

TOTAL MATERIAL	
SALES TAX %	
LABOR CHARGES	258 75
TOTAL	139 90

SERVICEMAN'S NAME: Dave

UNOCAL DEALER PLEASE READ BEFORE SIGNING. THIS IS TO CERTIFY THAT THE WORK DESCRIBED ABOVE WAS COMPLETED IN THE TIME INDICATED.

DEALER'S SIGNATURE

DATE 11-1-90

ARMOUR PETROLEUM SERVICE and EQUIPMENT CORPORATION

P.O. BOX 507, YACAVILLE, CA. 95696-0507

SHIPPING PAPER

PAGE# 1

TO: SOLANO COMMUNITY COLLEGE
1600 California Drive
Yacaville, California.

FROM:
Unocal 0746
3943 Broadway
OAKLAND

QTY	HM	DESCRIPTION	WEIGHT /GALLONS
( ) 55 gallon drum		Gasoline, Flammable liquid UN1203	
( ) 55 gallon drum		Diesel Fuel, Combustible liquid UN1993	
(//) 55 gallon drum	✓	> 99% water < 1% Fuel Combustible Liquid, UN1993	580 Gallons Total.
	✓	Placards Provided for this Load	

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SIGNED: Dan Chalcraft DATE: 11-1-90

SHIPPER: Unocal CARRIER'S # CA 10759

PER: KET VEHICLE # 4036234

DATE: 11-1-90

ARMOUR PETROLEUM SERVICE and EQUIPMENT CORPORATION

P.O. BOX 507, YACAVILLE, CA. 95696-0507

SHIPPING PAPER

PAGE# 2

TO: SOLANO COMMUNITY COLLEGE
1600 California Drive
Yacaville, California.

FROM:
UNOCAL 0746
3943 BROADWAY
OAKLAND

QTY	HM	DESCRIPTION	WEIGHT /GALLONS
( ) 55 gallon drum		Gasoline, Flammable liquid UN1203	
( ) 55 gallon drum		Diesel Fuel, Combustible liquid UN1993	
(4) 55 gallon drum	✓	> 99% water < 1% Fuel Combustible Liquid, UN1993	190 GALLONS TOTAL
	✓	Placards Provided for this Load	

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SIGNED: [signature] DATE: 10-31-90

SHIPPER: UNOCAL CARRIER'S # CA 10759

PER: ICET VEHICLE # 645546

DATE: 10-31-90

Armour Petroleum Service and Equipment Corporation

SINCE 1980

P.O. BOX 507 • VACAVILLE, CA 95696-0507

WELL MONITORING/SAMPLING

DRUM DATA SHEET

(TO BE ATTACHED TO EVERY WORKSHEET)

FILL OUT ALL THE QUESTIONS

FACILITY NAME & ADDRESS: Unocal 0746

3943 Broadway Oakland

NUMBER OF DRUMS ON SITE: 15

ARE DRUMS LABELED? YES: ✓ NO: _____

IF YES, DESCRIBE: LABEL: Purgewater OTHER: _____

WHAT DATE IS MARKED ON "DATE CONTAINER FILLED"?: 9-13-90

WHAT DATE IS MARKED ON "EXPECTED REMOVAL DATE"?: 12-13-90

ARE DRUMS NUMBERED? YES: ✓ NO: _____

GIVE VOLUME OF WATER PUMPED FROM EACH DRUM:

#1	55	#6	55
#2	55	#7	55
#3	55	#8	55
#4	55	#9	55
#5	55	#10	55

580 Gallons total

15 empty barrels Remain on site

#11. 30

FIELD TECHNICIAN: Dave DATE: 11-1-90

Armour Petroleum Service
and Equipment Corporation

SINCE 1980

P.O. BOX 507 • VACAVILLE, CA 95696-0507

WELL MONITORING/SAMPLING

DRUM DATA SHEET

(TO BE ATTACHED TO EVERY WORKSHEET)

FILL OUT ALL THE QUESTIONS

FACILITY NAME & ADDRESS: ~~Arco~~ Unocal 0746
3943 Broadway Oakland

NUMBER OF DRUMS ON SITE: 15

ARE DRUMS LABELED? YES: ✓ NO: _____

IF YES, DESCRIBE: LABEL: Ridge Water OTHER: _____

WHAT DATE IS MARKED ON "DATE CONTAINER FILLED"?: 9/13/90

WHAT DATE IS MARKED ON "EXPECTED REMOVAL DATE"?: 12/13/90

ARE DRUMS NUMBERED? YES: ✓ NO: _____

GIVE VOLUME OF WATER PUMPED FROM EACH DRUM:

#1 55
#2 55
#3 55
#4 25
#5 _____
#6 _____
#7 _____
#8 _____
#9 _____
#10 _____

190 Gallons Total

11 full drums Remain

FIELD TECHNICIAN: Dave DATE: 10-31-90

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
Hazardous Materials Program
80 Swan Way, Rm. 200
Oakland, CA 94621
(415)

October 5, 1990

Mr. Ron Bock
Unocal Corporation
2000 Crow Canyon Place, #400
San Ramon, CA 94583

RE: **Acknowledgement of receipt of letter and reports, Unocal #0746 (3943 Broadway, Oakland) and #5269 (2240 Mountain Blvd., Oakland)**

Dear Mr. Bock:

Thank you for submitting the reports that this office had requested in its recent Notice of Violation to Unocal. Although it appears that this notice took you by surprise, it was sent because we received no documents pertaining to either of these sites after a telephone conversation in which I requested documentation on both, last April. We still have no record of previous receipt of any of the materials that you sent in your August 16 letter. I did note that on page 4 of the Kaprealian work plan for 3943 Broadway, it states that the technical report documenting the work should be submitted to the RWQCB and to Alameda County Flood Control & Water Conservation District; our office is omitted. I suspect that there may be some miscommunication between Kaprealian and Unocal regarding who is responsible for sending which reports to whom. In any case, I think we are up to date now, and I appreciate your prompt response to my letter.

With regard to the groundwater contamination found at 3943 Broadway, it appears that four additional monitoring wells either have been or will soon be, installed. We concur with the locations of these monitoring points, as well as with their necessity, due to the fairly high concentration of gasoline dissolved in groundwater. As you're probably aware, the Regional Water Board requires that a responsible party define the "zero limits" of any groundwater plume, which must be the goal in this situation.

At 2240 Mountain Blvd., the most recent report indicates that there is in fact a monitoring well reasonably downgradient from the underground tank area. The report also describes the complex site geology associated with the Hayward Fault. Because of these factors and the low levels of contamination in perched groundwater, quarterly monitoring will be adequate at this site.

For these two sites, please be sure to send all future reports, supplemental work plans, etc., to my attention as soon as they are available. This will speed up case review and avoid the possibility

of our missing documents.

If you have any questions about this letter, please contact the undersigned at 271-4320.

Sincerely,

Gilbert M. Wistar

Gil Wistar
Hazardous Materials Specialist

cc: Lester Feldman, RWQCB
Rafat A. Shahid, Asst. Agency Director, Environmental Health
files

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
Hazardous Materials Program
80 Swan Way, Rm. 200
Oakland, CA 94621
(415)

Certified Mailer # *P 062 127 994*

August 10, 1990

Mr. Rick Sisk
Unocal Corporation
2175 N. California Blvd., Suite 650
Walnut Creek, CA 94596

NOTICE OF VIOLATION

Dear Mr. Sisk:

At Unocal #0746, located at 3943 Broadway in Oakland, three underground tanks were removed in August 1989; they were subsequently replaced with three new tanks. Because of contamination found in soil samples during the tanks' removal, this office required a preliminary investigation for soil and groundwater; as a result, three monitoring wells were installed at the site in October 1989, with relatively high levels of hydrocarbons found in groundwater downgradient of the tank pit. In a proposal dated November 30, 1989, Kaprealian Engineers discussed the need for three additional wells to define the limits of the plume.

When this office made a phone request for technical reports on April 11, 1990, Unocal stated that Kaprealian had applied for Zone 7 well drilling permits in January, and that a report on well installation and sampling had undoubtedly been prepared and would be sent to this office promptly. However, we have <u>still</u> received no reports or communications from Unocal or any consultant regarding this site. Thus, we have no evidence that these additional wells were installed, or that the required quarterly groundwater level measurements and sampling have taken place at the site.

As a result, Unocal is in violation of Sec. 25298 of the California Health and Safety Code, for improper (incomplete) closure of underground tanks. This section of code states that an underground tank owner/operator must demonstrate to the administering agency that the appropriate corrective or remedial actions have been taken, once a release is documented. To correct this violation, Unocal must submit to this office all well installation and sampling reports, work plans, and other pertinent documents that have been prepared since December 1, 1989. These reports are due by **September 10, 1990.** Any work plan submitted must include a schedule for implementing all tasks, as well as for the completion of technical reports.

This letter constitutes a formal request for technical reports (according to Sec. 13267 of the California Water Code, as well as

Sec. 25299.36 of the California Health and Safety Code). Copies of all documentation sent here should also be sent to the Regional Water Quality Control Board in Oakland (attn: Lester Feldman).

If you have any questions about this letter, please contact the undersigned at 271-4320.

Sincerely,

Gilbert M. Wistar

Gil Wistar
Hazardous Materials Specialist

cc: Lester Feldman, RWQCB
Gil Jensen, Alameda County District Attorney, Consumer and Environmental Protection Division
Rafat A. Shahid, Asst. Agency Director, Environmental Health
files

P 062 127 994

RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to Unocal Corporation RICK Sisk	
Street and No. 2175 N. California Blvd. Ste. 650	
P.O. State and ZIP Code Walnut Creek, CA 94596	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date August 10, 1990	

PS Form 3800, June 1985

11904

FAIRFIELD, CA
(707) 437-6668
SACRAMENTO, CA
(916) 441-2886
FAX NUMBER
(707) 437-4357
GENERAL CONTRACTOR
NUMBER 498721

ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION

SINCE 1980

INVOICE
PC 0746
14967

Please Pay from this invoice

REMIT TO:
P.O. BOX 507
VACAVILLE, CA 95696-0507

SOLD TO Unocal Corporation
ADDRESS 2000 Crow Canyon Place #[illegible]
CITY San Ramon CA 94583
ATTN Rick Sick

SHIP TO Unocal 0746
ADDRESS 3943 Broadway
CITY Oakland CA

CUSTOMER ORDER NO.	ACCOUNT NUMBER	TERMS	SALESMAN	INVOICE DATE
B2010A	V1322717	Net 30	[illegible]	8-9-90

	ORDERED	B/O	SHIPPED	DESCRIPTION	UNIT PRICE	AMOUNT
1						
2						
3				See attached M/O for		
4				work performed at		
5				Unocal 0746 to Remove		
6				105 gallons of Liquid		
7				from 3 on site Barrels		
8				As Requested Air Kei		
9						
10						
11						
12						
13				APPROVED		
14				AUG 13 1990		
15				RONALD E. BOCK		
16				Ronald E Bock		
17						
18				130-25-0746-920-367-51-1490262-082489		

SUBTOTAL	
TAX	
Use	14.55
FREIGHT	
LABOR	135.00
TOTAL $	253.00

TITLE TO THE FOREGOING GOODS SHALL NOT PASS TO CUSTOMER UNTIL TOTAL AMOUNTS SHOWN ON INVOICE HAVE BEEN PAID IN FULL TO ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION. IN THE EVENT OF EFFORTS OR LEGAL PROCEEDINGS TO ENFORCE THE COLLECTION OF SUCH SUMS DUE HEREIN, CUSTOMER AGREES TO PAY REASONABLE ATTORNEY'S FEES.

A **finance charge** of 1½% per month, which is an **annual percentage rate** of 18%, is charged on all past due accounts.

SIGNATURE

DATE DELIVERED 8-7-90

Thank You

ARMOUR PETROLEUM SERVICE and EQUIPMENT CORPORATION

P.O. BOX 507, VACAVILLE, CA. 95696-0507

SHIPPING PAPER

PAGE # 1-1

TO: SOLANO COMMUNITY COLLEGE
1600 California Drive
Vacaville, California.

FROM:
Unocal 746
3943 Broadway
Oakland

QTY	HM	DESCRIPTION	WEIGHT /GALLONS
( ) 55 gallon drum		Gasoline, Flammable liquid UN1203	
( ) 55 gallon drum		Diesel Fuel, Combustible liquid UN1993	
(3) 55 gallon drum	x	> 99% water < 1% Fuel Combustible Liquid, UN1993	145 gal
	x	Placards Provided for this Load	

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SIGNED: Alden J. Bradley DATE: 7 Aug 90

SHIPPER: Unocal 746 CARRIER'S # CA 10759

PER: K.E.I. VEHICLE # 1257391

DATE: 7 Aug. 90

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P. O. BOX 913
BENICIA, CA 94510
(707) 746 - 6915

September 13, 1989

Alameda County Health Agency
80 Swan Way, Rm. 200
Oakland, CA 94621

Attention: Mr. Gil Wistar

RE: Unocal Service Station #0746
3943 Broadway Street
Oakland, California

Dear Mr. Wistar:

Per the request of Mr. Tim Ross of Unocal Corporation, enclosed please find our report dated August 30, 1989, and our proposal dated August 30, 1989 for the above referenced site.

Should you have any questions, please feel free to call our office at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

Judy A. Dewey

Enclosure

cc: Tim Ross, Unocal

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
Hazardous Materials Program
80 Swan Way, Rm. 200
Oakland, CA 94621
(415)

September 12, 1989

Mr. Tim Ross
Unocal Corp.
2175 N. California Blvd., Ste. 650
Walnut Creek, CA 94596

Re: Unauthorized release from underground storage tank(s), Unocal #0746, 3943 Broadway, Oakland

Dear Mr. Ross:

During the removal of three underground storage tanks at the Unocal station referenced above, contaminated soil was discovered. In the sidewalls of the excavation trench, up to 290 ppm TPH were found in soil samples taken on August 16, 1989. This level exceeds thresholds established by the Regional Water Quality Control Board (RWQCB) for the occurrence of an "unauthorized release." Title 23 of the California Code of Regulations requires all such releases from underground tanks to be reported. An unauthorized release report has been filed with this office; your next step is to initiate groundwater investigation and/or cleanup activities at this site.

A preliminary assessment should be conducted to determine the extent of groundwater contamination that has resulted from the leaking pipe (contaminated soil has already been excavated and removed to the Division's satisfaction, and the new tank system has been installed). The information gathered by this investigation will be used to assess the need for additional actions at the site. The preliminary assessment should be designed to provide all of the information in the format shown in the attachment at the end of this letter. This format is based on RWQCB guidelines. You should be prepared to install one monitoring well, if you can verify the direction of groundwater flow in the immediate vicinity of the site, and three wells if you cannot.

Until cleanup is complete, you will need to submit reports to this office and to the RWQCB every three months (or at a more frequent interval, if specified at any time by either agency). These reports should include information pertaining to further investigative results; the methods and costs of cleanup actions implemented to date; and the method and location of disposal of any contaminated material.

Your work plan should be submitted to this office by **October 20, 1989**. Copies of the proposal should also be sent to the RWQCB (attention: Lester Feldman). You may implement remedial actions before approval of the work plan, but final concurrence by this office will depend on the extent to which the work done meets the requirements described in this letter. If you have any questions about this letter or about remediation requirements established by the RWQCB, please contact Gil Wistar, Hazardous Materials Specialist, at 271-4320.

Sincerely,

Edgar B. Howell for

Rafat A. Shahid, Chief
Hazardous Materials Division

RAS:GW:gw

enclosure

cc: Howard Hatayama, DOHS (w/o enclosure)
Lester Feldman, San Francisco Bay RWQCB (w/o enclosure)
Gil Jensen, District Attorney, Alameda County Consumer and Environmental Protection Agency (w/o enclosure)
files

WORK PLAN REQUIREMENTS FOR AN INITIAL SUBSURFACE INVESTIGATION

This outline should be followed by professional engineering or geologic consultants in preparing work plans to be submitted to the RWQCB and local agencies. Work plans must be signed by a California-registered engineer or geologist.

This outline should be referred to in context with the "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks" (June 2, 1988).

PROPOSAL FORMAT

I. Introduction

A. State the scope of work

B. Provide information on site location, background, and history

1. Describe the type of business and associated activities that take place at the site, including the number and capacity of operating tanks.

2. Describe previous businesses at the site.

3. Provide other tank information:

- number of underground tanks, their uses, and construction material;

- filing status and copy of unauthorized release form, if not previously submitted;

- previous tank testing results and dates, including discussion of inventory reconciliation methods and results for the last three years.

4. Other spill, leak, and accident history at the site, including any previously removed tanks.

II. Site Description

A. Describe the hydrogeologic setting of the site vicinity

B. Prepare a vicinity map (including wells located on-site or on adjoining lots, as well as any nearby streams

C. Prepare a site map

D. Summarize known soil contamination and results of excavation

1. Provide results in tabular form and show location of all soil samples (and water samples, if appropriate).

Sample dates, the identity of the sampler, and signed laboratory data sheets need to be included, if not already in possession of the County.

2. Describe any unusual problems encountered.

3. Describe methods that were used to store and dispose of contaminated soil.

III. Plan for Characterizing Groundwater Contamination

Construction and placement of wells should adhere to the requirements of the "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks."

A. Explain the proposed locations of monitoring wells (including construction diagrams), and prepare a map to scale

B. Describe the method of monitoring well construction and associated decontamination procedures

1. Expected depth and diameter of monitoring wells.

2. Date of expected drilling.

3. Locations of soil borings and sample collection method.

4. Casing type, diameter, screen interval, and pack and slot sizing technique.

5. Depth and type of seal.

6. Development method and criteria for determining adequate development.

7. Plans for disposal of cuttings and development water.

8. Surveying plans for wells (requirements include surveying to established benchmark to 0.01 foot).

C. Groundwater sampling plans

1. Water level measurement procedure.

2. Well purging procedures and disposal protocol.

3. Sample collection and analysis procedures.

4. Quality assurance plan.

5. Chain-of-custody procedures.

IV. Prepare a Site Safety Plan

8/31/89

UNDERGROUND STORAGE TANK UNAUTHORIZED RELEASE (LEAK) / CONTAMINATION SITE REPORT

EMERGENCY ☐ YES ☒ NO

HAS STATE OFFICE OF EMERGENCY SERVICES REPORT BEEN FILED? ☐ YES ☐ NO

REPORT DATE: 08/28/89 (M/M D/D Y/Y)

CASE #:

FOR LOCAL AGENCY USE ONLY
I HEREBY CERTIFY THAT I AM A DESIGNATED GOVERNMENT EMPLOYEE AND THAT I HAVE REPORTED THIS INFORMATION TO LOCAL OFFICIALS PURSUANT TO SECTION 25180.7 OF THE HEALTH AND SAFTY CODE.

SIGNED _____ DATE _____

REPORTED BY

NAME OF INDIVIDUAL FILING REPORT: Christina Lecce

PHONE: (707) 746-6915

SIGNATURE: Christina L Lecce

REPRESENTING ☒ OWNER/OPERATOR ☐ REGIONAL BOARD ☐ LOCAL AGENCY ☐ OTHER _____

COMPANY OR AGENCY NAME: Kaprealian Engineering, Inc.

ADDRESS: 638½ First Street (STREET) Benicia (CITY) CA (STATE) 94510 (ZIP)

RESPONSIBLE PARTY

NAME: Unocal Corporation ☐ UNKNOWN

CONTACT PERSON: Tim Ross

PHONE: (415) 945-7676

ADDRESS: 2175 N. California Blvd., #650 (STREET) Walnut Creek (CITY) CA (STATE) 94596 (ZIP)

SITE LOCATION

FACILITY NAME (IF APPLICABLE): Unocal Service Station #0746

OPERATOR: Clement K. Leung

PHONE: (415) 655-7662

ADDRESS: 3943 Broadway (STREET) Oakland (CITY) Alameda (COUNTY) 94611 (ZIP)

CROSS STREET: 40th Street

TYPE OF AREA ☒ COMMERCIAL ☐ INDUSTRIAL ☐ RURAL ☐ RESIDENTIAL ☐ OTHER _____

TYPE OF BUSINESS ☒ RETAIL FUEL STATION ☐ FARM ☐ OTHER _____

IMPLEMENTING AGENCIES

LOCAL AGENCY / AGENCY NAME: Alameda County Health Agency

CONTACT PERSON: Gil Wistar

PHONE: (415) 271-4320

REGIONAL BOARD: San Francisco Bay Region

PHONE: (415) 464-1255

SUBSTANCES INVOLVED

(1) NAME: gasoline — QUANTITY LOST (GALLONS): _____ ☒ UNKNOWN

(2) NAME: waste oil — QUANTITY LOST (GALLONS): _____ ☒ UNKNOWN

DISCOVERY/ABATEMENT

DATE DISCOVERED: 08/16/89 (M/M D/D Y/Y)

HOW DISCOVERED ☐ INVENTORY CONTROL ☐ SUBSURFACE MONITORING ☐ NUISANCE CONDITIONS ☐ TANK TEST ☒ TANK REMOVAL ☐ OTHER _____

DATE DISCHARGE BEGAN: ☒ UNKNOWN

HAS DISCHARGE BEEN STOPPED? ☒ YES ☐ NO IF YES, DATE: 08/16/89

METHOD USED TO STOP DISCHARGE (CHECK ALL THAT APPLY)
☒ REMOVE CONTENTS ☒ REPLACE TANK ☐ CLOSE TANK ☐ REPAIR TANK ☐ REPAIR PIPING ☐ CHANGE PROCEDURE ☐ OTHER _____

SOURCE/CAUSE

SOURCE OF DISCHARGE: ☐ TANK LEAK ☒ UNKNOWN ☐ PIPING LEAK ☐ OTHER

TANKS ONLY/CAPACITY: 2@10K & 1-280 GAL. AGE _____ YRS ☐ UNKNOWN

MATERIAL: ☐ FIBERGLASS ☒ STEEL ☐ OTHER _____

CAUSE(S): ☐ OVERFILL ☐ RUPTURE/FAILURE ☐ CORROSION ☒ UNKNOWN ☐ SPILL ☐ OTHER _____

CASE TYPE

CHECK ONE ONLY
☒ UNDETERMINED ☐ SOIL ONLY ☐ GROUNDWATER ☐ DRINKING WATER - (CHECK ONLY IF WATER WELLS HAVE ACTUALLY BEEN AFFECTED)

CURRENT STATUS

CHECK ONE ONLY
☒ SITE INVESTIGATION IN PROGRESS (DEFINING EXTENT OF PROBLEM) ☐ CLEANUP IN PROGRESS ☐ SIGNED OFF (CLEANUP COMPLETED OR UNNECESSARY) ☐ NO ACTION TAKEN ☐ POST CLEANUP MONITORING IN PROGRESS ☐ NO FUNDS AVAILABLE TO PROCEED ☐ EVALUATING CLEANUP ALTERNATIVES

REMEDIAL ACTION

CHECK APPROPRIATE ACTION(S) (SEE BACK FOR DETAILS)
☐ CAP SITE (CD) ☒ EXCAVATE & DISPOSE (ED) ☐ REMOVE FREE PRODUCT (FP) ☐ ENHANCED BIO DEGRADATION (IT)
☐ CONTAINMENT BARRIER (CB) ☒ EXCAVATE & TREAT (ET) ☐ PUMP & TREAT GROUNDWATER (GT) ☐ REPLACE SUPPLY (RS)
☐ TREATMENT AT HOOKUP (HU) ☐ NO ACTION REQUIRED (NA) ☒ OTHER (OT) Install groundwater monitoring system.

COMMENTS

ALAMEDA COUNTY
DEPT. OF ENVIRONMENTAL HEALTH
HAZARDOUS MATERIALS

HSC 05 (4/87)

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P. O. BOX 913
BENICIA, CA 94510
(707) 746 · 6915

FAX #: (707) 746-5581

TRANSMITTAL PAGE

DATE: August 22, 1989

TO: Gil Kistar - Alameda County

FROM: Mardo Kaprealian

Number of Pages
(including cover): 5

SUBJECT: Exxon #0746 - Oakland
Site Plan and analyses

If any problems occur in receiving, please call the number listed above.

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P. O. BOX 913
BENICIA, CA 94510
(707) 746-6915

FAX #: (707) 746-5581

TRANSMITTAL PAGE

DATE: August 22, 1989

TO: Gil Nistar - Alameda County

FROM: Wardo Kaprealian

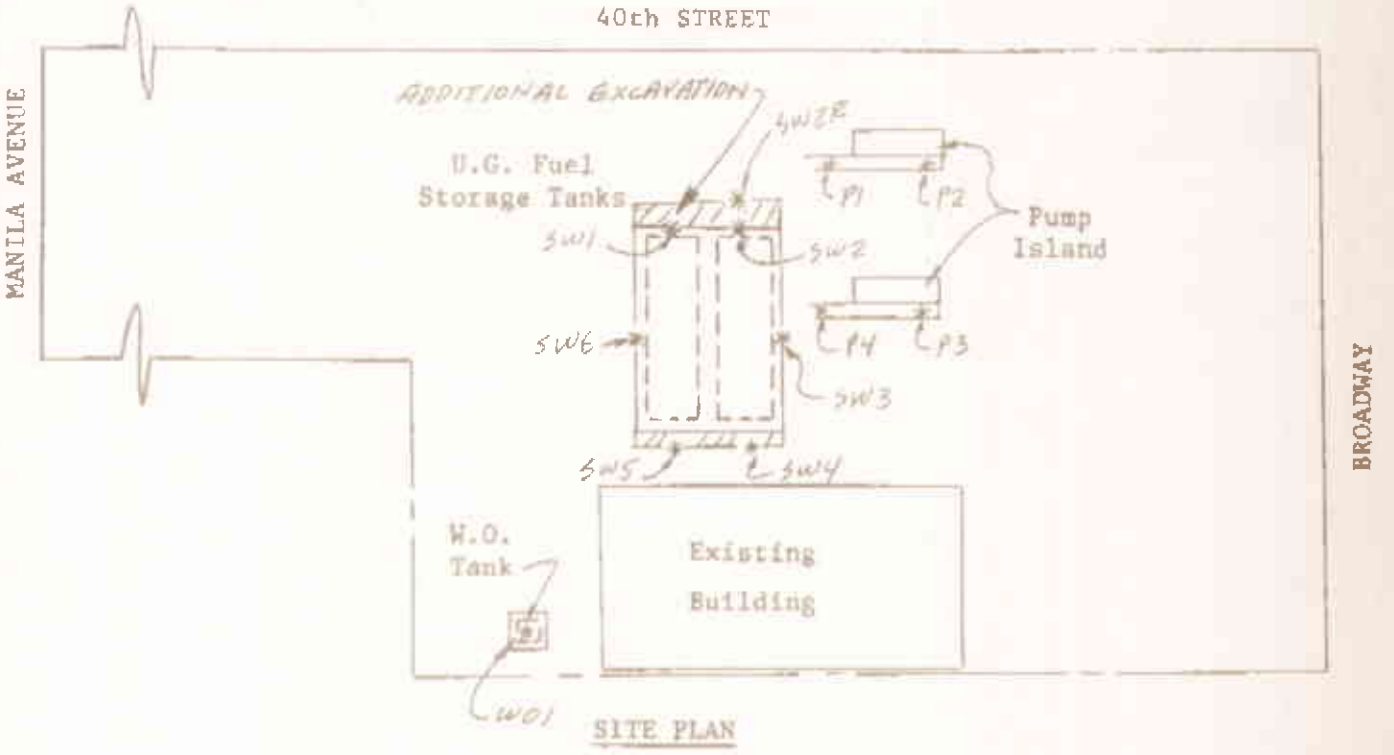
Number of Pages
(including cover): 5

SUBJECT: Unocal #0746 - Oakland
Site Plan and analyses

If any problems occur in receiving, please call the number listed above.

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P O BOX 913
BENICIA, CA 94510
(707) 746 - 6915

2



SITE PLAN

0 30 60
feet

* SOIL SAMPLE LOCATION

Unocal Service Station #0746
3943 Broadway Street
Oakland, California

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kapreelian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 3943 Broadway/40th St.	Sampled: Aug 18, 1989
P.O. Box 913	Matrix Descript:	Soil	Received: Aug 18, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed: Aug 21, 1989
Attention: Mardo Kapreelian, P.E.	First Sample #:	908-2222	Reported: Aug 22, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
908-2222	P1	6.1	N.D.	N.D.	N.D.	N.D.
908-2223	P2	36	0.52	4.4	1.4	8.0
908-2224	P3	20	0.30	2.5	1.1	5.6
908-2225	P4	3.8	0.11	0.19	0.10	0.23
Detection Limits:		1.0	0.05	0.1	0.1	0.1

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kapreelian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 3843 Broadway/40th St.	Sampled:	Aug 18, 1989
P.O. Box 913	Sample Descript.:	Soil, SW2 (R)	Received:	Aug 18, 1989
Benicia, CA 94510	Analysis Method:	EPA 8030/8015/8020	Analyzed:	Aug 21, 1989
Attention: Mardo Kapreelian, P.E.	Lab Number:	908-2221	Reported:	Aug 22, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTEX DISTINCTION (EPA 8015/8020)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Low to Medium Boiling Point Hydrocarbons	1.0	N.D.
Benzene	0.05	N.D.
Toluene	0.1	N.D.
Ethyl Benzene	0.1	N.D.
Xylenes	0.1	N.D.

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

SEQUOIA ANALYTICAL
680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaprealian Engineering, Inc.
P.O. Box 913
Benicia, CA 94510
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal, Oakland, 3943 Broadway/40th St.
Matrix Descript: Soil
Analysis Method: EPA 5030/8015/8020
First Sample #: 908-1728

Sampled: Aug 16, 1989
Received: Aug 16, 1989
Analyzed: Aug 17, 1989
Reported: Aug 18, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
908-1728	SW1	13	N.D.	0.13	0.15	0.39
908-1729	SW2	290	0.82	8.7	7.8	44
908-1730	SW3	N.D.	N.D.	N.D.	N.D.	N.D.
908-1731	SW4	N.D.	N.D.	N.D.	N.D.	N.D.
908-1732	SW5	N.D.	N.D.	N.D.	N.D.	N.D.
908-1733	SW6	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		1.0	0.05	0.1	0.1	0.1

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur Q. Burton
Laboratory Director

908172B.KE <1>

SEQUOIA ANALYTICAL
680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 3643 Broadway/40th St.	Sampled: Aug 16, 1989
P.O. Box 913	Matrix Descript:	Soil	Received: Aug 16, 1989
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed: Aug 17, 1989
Attention: Mardo Kaprealian, P.E.	First Sample #:	908-1728	Reported: Aug 18, 1989

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
908-1728	SW1	13	N.D.	0.15	0.15	0.39
908-1729	SW2	290	0.62	8.7	7.8	44
908-1730	SW3	N.D.	N.D.	N.D.	N.D.	N.D.
908-1731	SW4	N.D.	N.D.	N.D.	N.D.	N.D.
908-1732	SW5	N.D.	N.D.	N.D.	N.D.	N.D.
908-1733	SW6	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		1.0	0.05	0.1	0.1	0.1

Low to Medium Boiling Point hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

908172B.KEI <1>

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P.O. BOX 813
BENICIA, CA 94510
(415) 676-5100 (707) 746-5915

CHAIN OF CUSTODY

SAMPLER: HAGOP (Signature) DATE/TIME OF COLLECTION: 8-16-89 TURN AROUND TIME: 24 HRS

SAMPLE DESCRIPTION AND PROJECT NUMBER: UNOCAL - OAKLAND - 3943 Broadway / 40[illegible]

SAMPLE #	ANALYSES	GRAB OR COMP.	NUMBER OF CONTAINERS	SOIL/ WATER	
SW1	TPH-G/BTXE	G	1	S	908/2
SW2	TPH-G/BTXE	G	1	S	2
SW3	TPH-G/BTXE	G	1	S	3
SW4	TPH-G/BTXE	G	1	S	3
SW5	TPH-G/BTXE	G	1	S	3
SW6	TPH-G/BTXE	G	1	S	3
		&			

RELINQUISHED BY*	TIME/DATE	RECEIVED BY*	TIME/DATE
1. Hagop Kevorkian	1700 8-16-89	Eli #23	8/16/89 1700
2. Eli #23	8-16-89	Jack Newsom	18:32 8-16-89
3.			

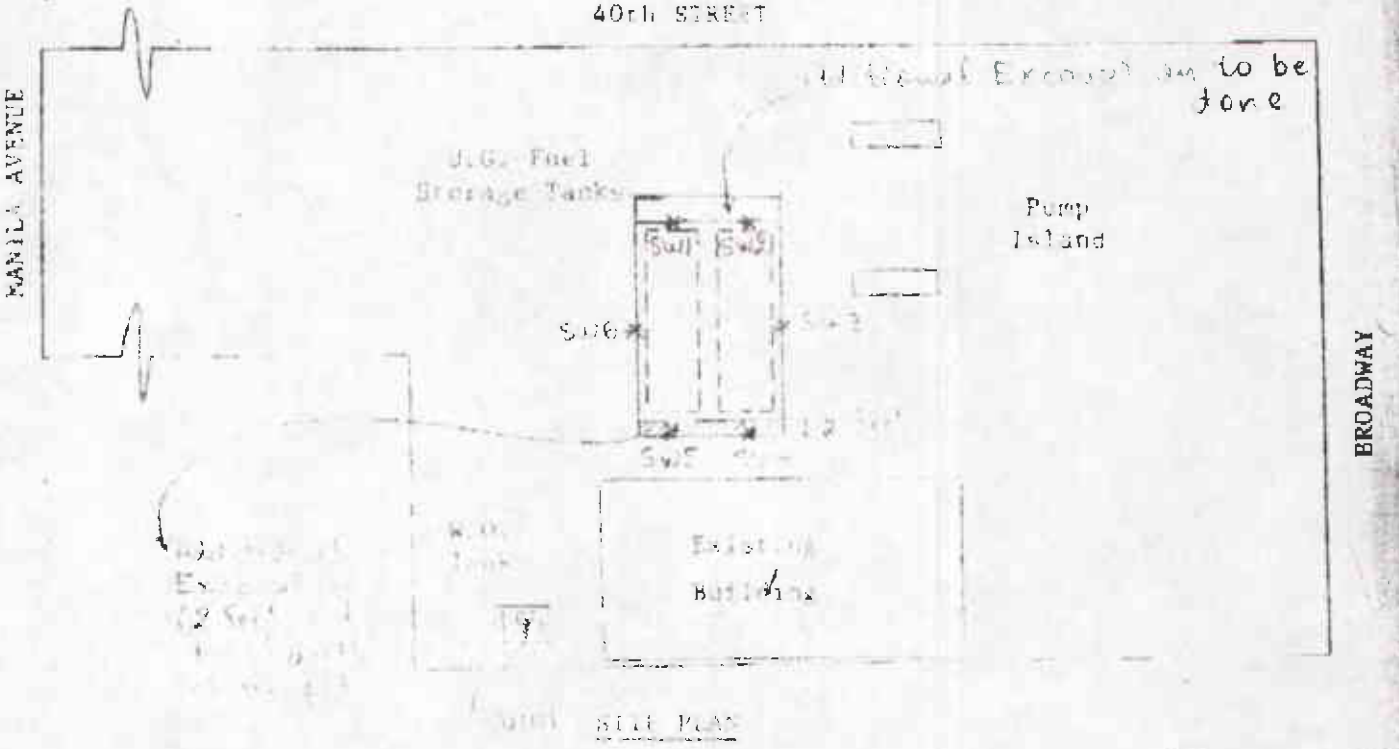
* STATE AFFILIATION NEXT TO SIGNATURE

REMARKS:

NOTE: IF REGULAR TURNAROUND, SOIL ANALYSES MUST BE COMPLETED WITHIN 14 CALENDAR DAYS OF SAMPLE COLLECTION. WATER ANALYSES MUST BE COMPLETED WITHIN 7 CALENDAR DAYS FOR BTX&E (UNLESS SAMPLE HAS BEEN PRESERVED), AND 14 CALENDAR DAYS FOR TPH AS GASOLINE; EXTRACT TPH AS DIESEL WITHIN 14 CALENDAR DAYS.

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P O BOX 913
BENICIA CA 94510
(707) 746 6915

12



to be done

Shell Service Station #0746
Broadway Street
Oakland, California

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P O BOX 913
BENICIA, CA 94510
(707) 746-6915

FAX #: (707) 746-5581

TRANSMITTAL PAGE

DATE: 8-17-89

TO: Mr. Gil Wistar

FROM: UBIG (KET)

Number of Pages
(including cover): 4

losed
alyses,
th

2 feet
SW5 are
feet horizonta

it sample
be analyzed

white -env.health
yellow -facility
pink -files

ALAMEDA COUNTY, DEPARTMENT OF ENVIRONMENTAL HEALTH

Hazardous Materials Inspection Form

80 Swan Way, #200
Oakland, CA 94621
(415) 271-4320

II,III

Site ID # ____ Site Name Broadway Unocal Today's Date 8/16/89

Site Address 3943 Broadway

City Oakland Zip 94611 Phone ____

____ MAX AMT stored > 500 lbs, 55 gal., 200 cft.?

Inspection Categories:
____ I. Haz. Mat/Waste GENERATOR/TRANSPORTER
____ II. Business Plans, Acute Hazardous Materials
✓ III. Underground Tanks

* Calif. Administration Code (CAC) or the Health & Safety Code (HS&C)

II.A BUSINESS PLANS (Title 19)

___	1. Immediate Reporting	2703
___	2. Bus. Plan Stds.	25503(b)
___	3. RR Cars > 30 days	25503.7
___	4. Inventory Information	25504(a)
___	5. Inventory Complete	2730
___	6. Emergency Response	25504(b)
___	7. Training	25504(c)
___	8. Deficiency	25505(a)
___	9. Modification	25505(b)

II.B ACUTELY HAZ. MAT'LS

___	10. Registration Form Filed	25533(a)
___	11. Form Complete	25533(b)
___	12. RMPP Contents	25534(c)
___	13. Implement Sch. Req'd? (Y/N)	___
___	14. OffSite Conseq. Assess.	25524(c)
___	15. Probable Risk Assessment	25534(d)
___	16. Persons Responsible	25534(g)
___	17. Certification	25534(i)
___	18. Exemption Request? (Y/N)	25536(b)
___	19. Trade Secret Requested?	25538

III. UNDERGROUND TANKS (Title 23)

General

___	1. Permit Application	25284 (H&S)
___	2. Pipeline Leak Detection	25292 (H&S)
___	3. Records Maintenance	2712
___	4. Release Report	2651
___	5. Closure Plans	2670

Monitoring for Existing Tanks

___ 6. Method
1) Monthly Test
2) Daily Vadose
Semi-annual gndwater
One time soils
3) Daily Vadose
One time soils
Annual tank test
4) Monthly Gndwater
One time soils
5) Daily Inventory
Annual tank testing
Cont pipe leak det
Vadose/gndwater mon.
6) Daily Inventory
Annual tank testing
Cont pipe leak det
7) Weekly Tank Gauge
Annual tank tstng
8) Annual Tank Testing
Daily Inventory
9) Other ____

___	7. Precis Tank Test Date: ____	2643
___	8. Inventory Rec.	2644
___	9. Soil Testing.	2646
___	10. Ground Water.	2647

New Tanks

___	11. Monitor Plan	2632
___	12. Access. Secure	2634
___	13. Plans Submit Date: ____	2711
___	14. As Built Date: ____	2635

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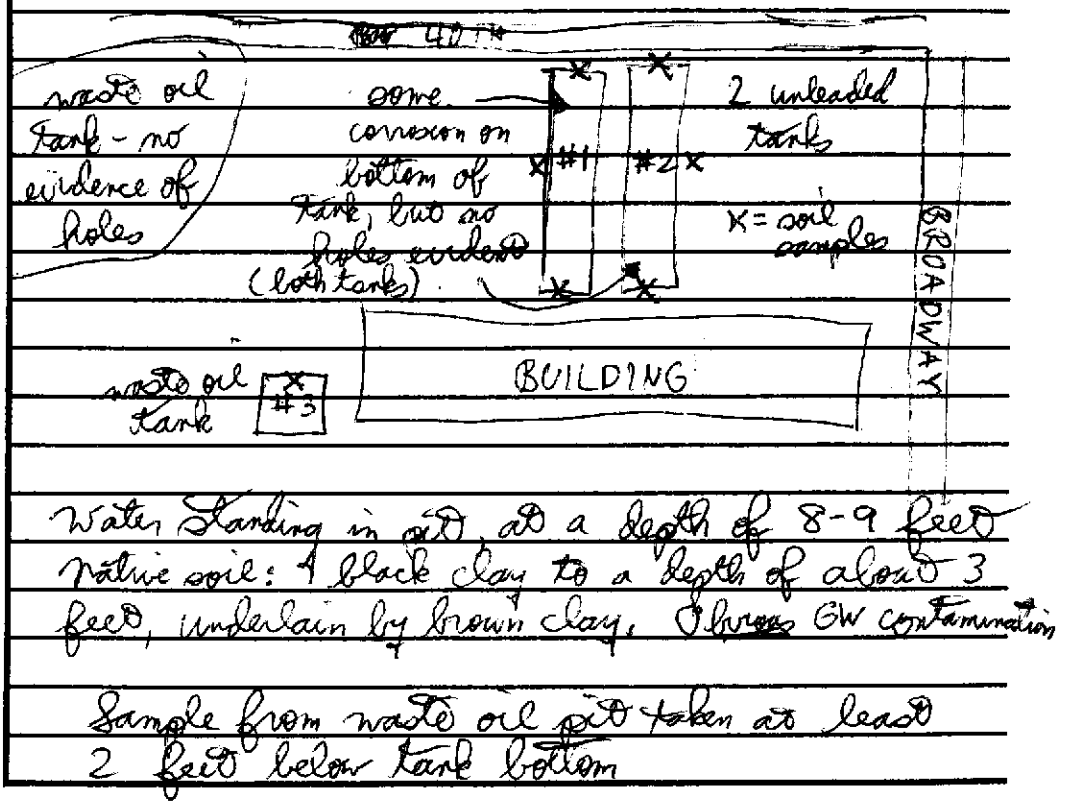
Comments: Removal of 3 tanks from station — 2 10,000-gal. gasoline and one 280-gal. waste oil



Water standing in pit, at a depth of 8-9 feet. Native soil: 4 black clay to a depth of about 3 feet, underlain by brown clay. Shows GW contamination

Sample from waste oil pit taken at least 2 feet below tank bottom

II, III

Contact: HAGOP KEVORK

Title: Civil Engineer

Signature: Hagop Kevork

Inspector: ____

Signature: Gilbert M. Wistar

ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH
HAZARDOUS MATERIALS DIVISION
80 SWAN WAY, ROOM 200
OAKLAND, CA 94621
PHONE NO. 415/271-4320

ACCEPTED 7/11/89

DEPARTMENT OF ENVIRONMENTAL HEALTH
470 - 27th Street, Third Floor
Oakland, CA 94612
Telephone: (415) 874-7227

These plans have been reviewed and found to be acceptable and essentially meet the requirements of State and local health laws. Changes to your plans indicated by this Department are to ensure compliance with State and local laws. The project proposed herein is now released for issuance of any required building permits for construction.

One copy of these accepted plans must be on the job and available to all contractors and craftsmen involved with the removal.

Any changes or alterations of these plans and specifications must be submitted to this Department and to the Fire and Building Inspection Department to determine if such changes meet the requirements of State and local laws.

Notify this Department at least 48 hours prior to the following required inspections:

gmw Removal of Tank and Piping
gmw Sampling
Final Inspection

Issuance of a permit to operate is dependent on compliance with accepted plans and all applicable laws and regulations.

THERE IS A FINANCIAL PENALTY FOR NOT OBTAINING THESE INSPECTIONS.

UNDERGROUND TANK CLOSURE/MODIFICATION PLANS

1. Business Name BROADWAY UNION #0746

   Business Owner CLEMENT K. LEUNG

2. Site Address 3943 BROADWAY

   City OAKLAND Zip 94611 Phone (415)655-7662

3. Mailing Address _____

   City _____ Zip _____ Phone _____

4. Land Owner UNOCAL OIL CO.

   Address 2175 N. CALIFORNIA BLVD. #650 City, State WALNUT CREEK, CA Zip 94596

5. EPA I.D. No. CAD 982054223

6. Contractor R. W. Johnston & Son

   Address 801-53rd Ave

   City Oakland 94601 Phone 261.9424

   License Type A-B ID# 259839

7. Consultant JOE COMSTOCK - UNOCAL OIL CO.

   Address 76 BROADWAY

   City SACRAMENTO Phone (916) 446-4981

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66 3.

8. Contact Person for Investigation

Name JOE COMSTOCK Title CONSTRUCTION ENG.-UNOCAL

Phone (916)446-4981

9. Total No. of Tanks at facility 3

10. Have permit applications for all tanks been submitted to this office? Yes [X] No [ ]

11. State Registered Hazardous Waste Transporters/Facilities

a) Product/Waste Tranporter

Name H & H SHIPPING EPA I.D. No. CAD004771168

Address 220 CHINA BASIN ST

City San FRANCISCO State CA Zip 94107

b) Rinsate Transporter

Name Same EPA I.D. No. _____

Address _____

City _____ State _____ Zip _____

c) Tank Transporter

Name H & H SHIPPING EPA I.D. No. CAD004771168

Address Same

City _____ State _____ Zip _____

d) Tank Disposal Site

Name LEVIN METALS EPA I.D. No. _____

Address 600 S. 4TH STREET

City RICHMOND State CA Zip _____

e) Contaminated Soil Transporter

Name H & H SHIPPING EPA I.D. No. CAD004771168

Address 220 CHINA BASIN ST

City SAN FRANCISCO State Ca Zip 94107

12. Sample Collector

Name _____

Company APPLIED GEOSYSTEMS

Address 4191 POWER INN RD.

City SACRAMENTO State CA Zip _____ Phone (916)452-2901

13. Sampling Information for each tank or area

Tank or Area		Material sampled	Location & Depth
Capacity	Historic Contents (past 5 years)		
9,700 GAL.	AUTOMOTIVE FUEL		
9,700 GAL.	AUTOMOTIVE FUEL		
280 GAL.	WASTE OIL		

14. Have tanks or pipes leaked in the past? Yes [ ] No [ ]

If yes, describe. _____

15. NFPA methods used for rendering tank inert? Yes [✓] No [ ]

If yes, describe. 10 LBS. DRY ICE PER 1000 GAL. OF TANK CAPACITY

An explosion proof combustible gas meter shall be used to verify tank inertness.

16. Laboratories

Name APPLIED GEOSYSTEMS

Address 4191 POWER INN RD.

City SACRAMENTO State CA Zip _____

State Certification No. 153

17. Chemical Methods to be used for Analyzing Samples

Contaminant Sought	EPA, DHS, or Other Sample Preparation Method Number	EPA, DHS, or Other Analysis Number
Gasoline TPH - G BTX + E		GC FID 5030 8020 or 8240
waste Oil TPH - D TPH - G BTX + E chlorinated HC's TOG Semi - VOC's		GC FID 3550 GC FID 5030 8020 or 8240 8010 or 8240 503 D+E 8270

18. Submit Site Safety Plan

19. Workman's Compensation: Yes [X] No [ ]

Copy of Certificate enclosed? Yes [X] No [ ]

Name of Insurer Republic Indemnity

20. Plot Plan submitted? Yes [X] No [ ]

21. Deposit enclosed? Yes [X] No [ ]

22. Please forward to this office the following information within 60 days after receipt of sample results.

a) Chain of Custody Sheets

b) Original Signed Laboratory Reports

c) TSD to Generator copies of wastes shipped and received

d) Attachment A summarizing laboratory results

I declare that to the best of my knowledge and belief the statements and information provided above are correct and true. I understand that information in addition to that provided above may be needed in order to obtain an approval from the Department of Environmental Health and that no work is to begin on this project until this plan is approved.

I understand that any changes in design, materials or equipment will void this plan if prior approval is not obtained.

I understand that all work performed during this project will be done in compliance with all applicable OSHA (Occupational Saftey and Health Administration) requirements concerning personnel and safety.

I will notify the Department of Environmental Health at least two (2) working days (48 hours) after approval of this closure plan in advance to schedule any required inspections. I understand that site and worker safety are solely the responsibility of the property owner or his agent and that this responsibility is not shared nor assumed by the County of Alameda.

Signature of Contractor

Name (please type) G.W. JOHNSTON

Signature by R H Burge

Date 7/6/89

Signature of Site Owner or Operator

Name (please type) LORI R. AUSTIN - AGENT FOR UNOCAL

Signature Lori R. Austin

Date 5.24.89

NOTES:

1. Any changes in this document must be approved by this Department.

2. Any leaks discovered must be submitted to this office on an underground storage tank unauthorized leak/contamination site report form within 5 days of its discovery.

3. Three (3) copies of this plan must be submitted to this Department. One copy must be at the construction site at all times.

4. After approval of plan, notification of at least two (2) working days (48 hours) must be given to this Department prior to removal of tank(s).

5. A copy of your approved plan must be sent to the landowner.

6. Triple rinse means that:

   a) Final rinse must contain less than 100 ppm of Gasoline (EPA method 8020 for soil, or EPA method 602 for water) or Diesel (EPA method 418.1). Other methods for halogenated volatile organics (EPA method 8010 for soil, EPA method 601 for water) may be required. The composition of the final rinse must be demonstrated by an original or facsimile report from a laboratory certified for the above analyses.

   b) Tank interior is shown to be free from deposits or residues upon a visual examination of tank interior.

   c) Tank should be labelled as "tripled rinsed; laboratory certified analysis available upon request" with the name and address of the contractor.

If all the above requirements cannot be met, the tank must be transported as a hazardous waste.

7. Any cutting into tanks requires local fire department approval.

UNDERGROUND TANK CLOSURE/MODIFICATION PLANS

ATTACHMENT A

SAMPLING RESULTS

Tank or Area	Contaminant	Location & Depth	Results (specify units)

INSTRUCTIONS

2. SITE ADDRESS
Address at which closure or modification is taking place.

5. EPA I.D. NO.
This number may be obtained from the State Department of Health Services, 916/324-1781.

6. CONTRACTOR
Prime contractor for the project.

7. OTHER
List professional consultants here.

12. SAMPLE COLLECTOR
Persons who are collecting samples.

13. SAMPLING INFORMATION
Historic contents - the principal product(s) used in the last 5 years.

Material sampled - i.e., water, oil, sludge, soil, etc.

16. LABORATORIES
Laboratories used for chemical and geotechnical analyses.

17. CHEMICAL METHODS:
All sample collection methods and analyses should conform to EPA or DHS methods.

Contaminant - Specify the chemical to be analyzed.

Sample Preparation Method Number - The means used to prepare the sample prior to analyses - i.e., digestion techniques, solvent extraction, etc. Specify number of method and reference if not an EPA or DHS method.

Analysis Method Number - The means used to analyze the sample - i.e., GC, GC-MS, AA, etc. Specify number of method and reference if not a DHS or EPA method.

NOTE:
Method Numbers are available from certified laboratories.

18. SITE SAFETY PLAN
A plan outlining protective equipment and additional specialized personnel in the event that significant amount of hazardous materials are found. The plan should consider the availability of respirators, respirator cartridges, self-contained breathing apparatus (SCBA) and industrial hygienists.

19. ATTACH COPY OF WORKMAN'S COMPENSATION

20. PLOT PLAN

The plan should consists of a scaled view of the facility at which the tank(s) are located and should include the following information:

a) Scale

b) North Arrow

c) Property Line

d) Location of all Structures

e) Location of all relevant existing equipment including tanks and piping to be removed

f) Streets

g) Underground conduits, sewers, water lines, utilities

h) Existing wells (drinking, monitoring, etc.)

i) Depth to ground water

j) All existing tanks in addition to the ones being pulled

rev. 9/88
mam

CERTIFICATE OF INSURANCE

ISSUE DATE (MM/DD/YY): 07/06/89

PRODUCER

Putnam, Knudsen
& Wieking, Inc.
P.O. Box 24205
Oakland, CA 94623

CODE SUB-CODE

INSURED

R. W. Johnston & Son
801 53rd Avenue
Oakland, CA 94601

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

COMPANIES AFFORDING COVERAGE

COMPANY LETTER	A	Fireman's Fund
COMPANY LETTER	B	Fireman's Fund
COMPANY LETTER	C	
COMPANY LETTER	D	Republic Indemnity
COMPANY LETTER	E	

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	ALL LIMITS IN THOUSANDS	
A	GENERAL LIABILITY [X] COMMERCIAL GENERAL LIABILITY [X] [ ] CLAIMS MADE [X] OCCUR. [ ] OWNER'S & CONTRACTOR'S PROT. [ ]	MXX80319872	09/01/88	09/01/89	GENERAL AGGREGATE PRODUCTS-COMP/OPS AGGREGATE PERSONAL & ADVERTISING INJURY EACH OCCURRENCE FIRE DAMAGE (Any one fire) MEDICAL EXPENSE (Any one person)	$ 2,000 $ 2,000 $ 1,000 $ 1,000 $ 50 $ 5
B	AUTOMOBILE LIABILITY [X] ANY AUTO [ ] ALL OWNED AUTOS [ ] SCHEDULED AUTOS [X] HIRED AUTOS [X] NON-OWNED AUTOS [ ] GARAGE LIABILITY [ ]	MXX80319872	09/01/88	09/01/89	COMBINED SINGLE LIMIT BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE	$ 1,000 $ $ $
	EXCESS LIABILITY [ ] [ ] OTHER THAN UMBRELLA FORM				EACH OCCURRENCE AGGREGATE	$ $
D	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY	[90]PC989901	07/01/89	07/01/90	STATUTORY $ 1,000 (EACH ACCIDENT) $ 1,000 (DISEASE-POLICY LIMIT) $ 1,000 (DISEASE-EACH EMPLOYEE)	
	OTHER					

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/RESTRICTIONS/SPECIAL ITEMS

Re: Insured's California Operations. JPW/LM/prs

CERTIFICATE HOLDER

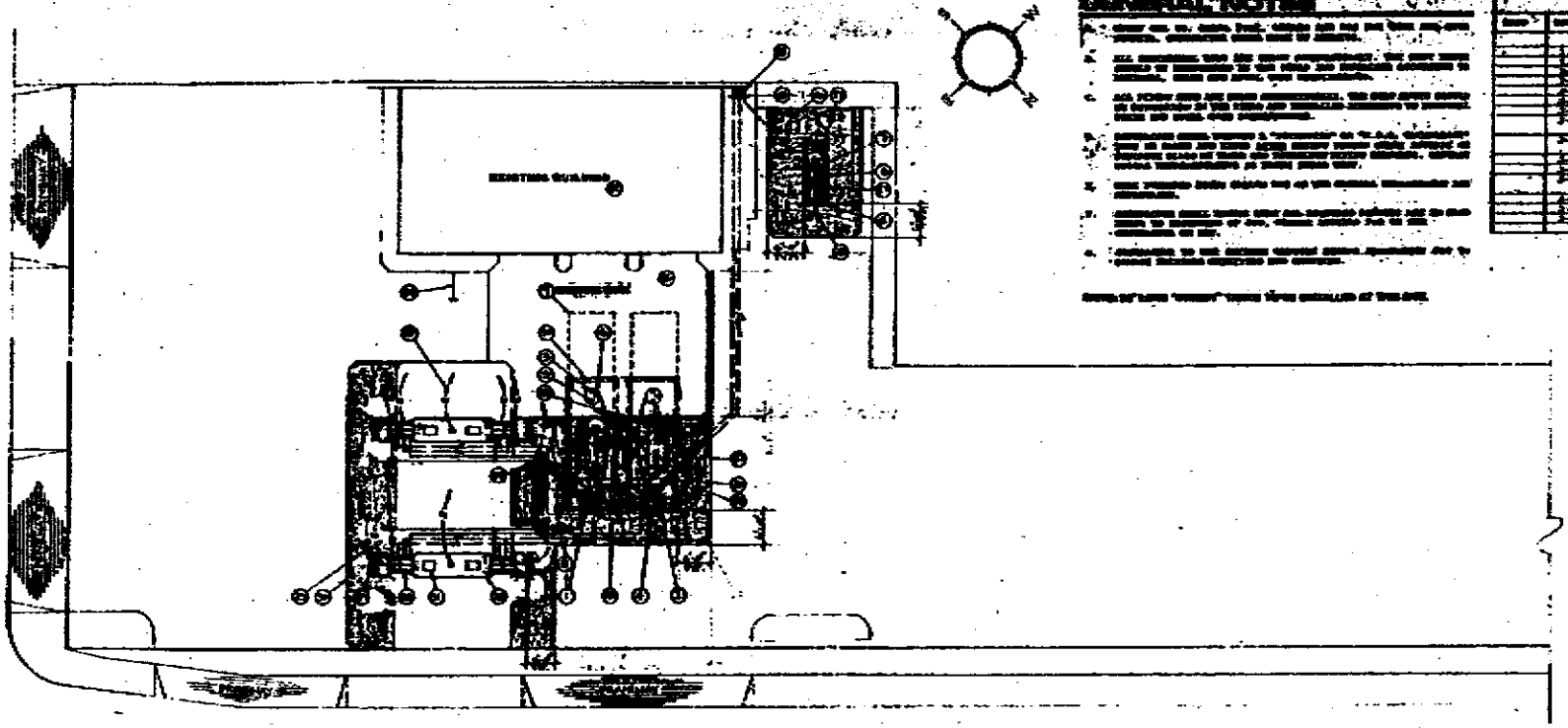
Alameda County Health Dept.
Hazardous Materials Division
80 Swan Way
Oakland, CA 94621

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY ~~WILL ENDEAVOR TO~~ MAIL 10 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, ~~BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.~~

AUTHORIZED REPRESENTATIVE

James P. Wieking



GENERAL NOTES

DRAWING INDEX

PLAN NOTES

PLAN NOTES (CONT.)

GENERAL ARRANGEMENT
TANK REPLACEMENT
3943 BROADWAY & 40TH STREET
OAKLAND, CALIFORNIA

1.1

July 7, 1989

SITE SAFETY PLAN
UNOCAL SERVICE STATION NO. 0746
3943 BROADWAY
OAKLAND, CALIFORNIA
RHL JOB NO. 1428

SITE SAFETY PLAN - GASOLINE TANK REMOVAL

1. For underground gasoline tanks, arrange for disposal of remaining liquid contents with authorized disposal service.

2. Drain and flush all piping into tank or appropriate container.

3. Remove all flammable liquid from the tank. Use hand pump to remove the bottom few inches of liquid.

4. Uncover tank and disconnect attached piping.

5. Prior to complete excavation and tank removal the tanks must be res-purged by the following method.

   Preferred method for conditioning tank:

   Make vapors inert by adding 15 lbs. of dry ice (carbon dioxide) per 1,000 gal. of tank capacity.

   The vapors in the tank will be made inert by adding solid carbon dioxide (dry ice) in the amount of 15 lbs. per 1,000 gal. of tank capacity. The dry ice should be crushed and distributed evenly over the greatest possible area to secure rapid evaporation. As the dry ice vaporizes, flammable vapors will flow out of the tank and may surround the area. Hence, observe all normal safety precautions regarding flammable vapors. Make sure that all of the dry ice has vaporized.

   After the tank has been freed of vapors and verified to below 10 percent of the lower explosive level using calibrate gas detector, and prior to moving t\from the site, plug or cap all holes. Use threaded (boiler) plugs to plug any corrosion leak holes. One tank fitting plug should have a 1/8" vent hole to prevent the tank from being subjected to an excessive pressure differential caused by extreme temperature changes.

SITE SAFETY PLAN - GASOLINE TANK REMOVAL

6. Temporarily plug all tank openings, complete excavation and remove the tank; placing it in a secure location. Block the tank to prevent movement. USE EXTREME CAUTION DURING REMOVAL OPERATION.

7. Remove tanks and secure at grade.

8. No fiberglass or steel tank shall be reused. Render all tanks useless after removing from site.

9. As an added precaution, regardless of condition, the tanks shall be labeled adjacent to the fill opening in legible letters as follows:

"TANK HAVE CONTAINED FLAMMABLE LIQUIDS
NOT GAS-FREE
NOT SUITABLE FOR FOOD OR DRINKING WATER"

10. Assure tank disposal is in accordance with governing regulations.

11. Company Representative and Contractor shall inspect open excavation for evidence of product leakage.

12. the Contractor shall have the following items on site;

    a) Fire extinguishers
    b) LEL meter
    c) First Aid Kit
    d) Hard hat and protective clothing for all personnel
    e) Access to an Industrial Hygienist

13. When the site is left unattended, surround the excavation with a 6"-0" high removable chain link fence.

EMERGENCY PLAN

In the event of an accident, the contractor shall proceed with the following steps:

1. Dial 911 and provide the following information:

SITE SAFETY PLAN - GASOLINE TANK REMOVAL

"THERE IS A (FIRE OR DANGEROUS SPILL) AT 3943 BROADWAY, OAKLAND, CA". If anyone is trapped or needs medical attention, tell the answering dispatcher. Stay on the phone and be prepared to answer any questions concerning the situation.

2. Attend any injured persons and direct incoming assistance to them.

3. Attempt to extinguish any fire if you can do so safely. Have the extinguisher ready to use in the event of any dangerous spill. Try to contain any spill, or use absorbent on smaller spills.

4. Report to arriving emergency response personnel to provide them any information or assistance they may need.

5. Notify the following:

UNOCAL Representative, Tim Ross	(415) 945-7676
Alameda County Environmental Health	(415) 271-4320
State Office of Emergency Services	(800) 852-7550 (24 hrs)